

Opinion

As Government Outsources More IT, Highly Skilled In-House Technologists Are More Essential

We need more, not fewer technologists at all levels of government to ensure high-quality, cost-effective programs.

THE U.S. FEDERAL government currently spends twice as much on contractors as on employees. Private contractors underlie nearly everything we expect the government to do, from renewing passports to monitoring outbreaks. Capacity for project management is table stakes for effective outsourcing. Among the many losses of expertise in the federal government recently, we have seen technical capacity gutted. In the past month, more than 20 data scientists, engineers, and technical managers resigned from their posts with the U.S. Digital Service (USDS); another 40 were fired; and all employees of 18F—a technology team within the General Services Administration—were terminated. USDS and 18F served as internal technology consultants, developed open source tools and standards for government, and advised partner agencies on building better, more flexible systems at lower cost. As researchers and data scientists who have worked directly to help state government agencies improve technological processes, we think cutting these staff is a move in the wrong direction.

In-house technologists shape expectations around private contracts, troubleshoot and propose alternatives when things break, and save time through myriad improvisations. Particularly at 18F, there was a heavy



focus on improving procurement and vendor management at the local, state, and federal levels. As Waldo Jaquith, a former 18F technical lead, summarized:

“18F did two things, both for agencies that hired them to help with projects: It built software and it taught agencies how to hire and oversee vendors to build software. The former raised the bar by showing agencies what ‘good’ looks like, the latter allowed those practices to expand sustainably.”⁴

The culling of technical expertise to-

day will further diminish the federal government’s capacity to effectively leverage private vendors.

State governments that have previously slashed their in-house technical capacity offer us a warning. They serve as reminders that we need more, not fewer technologists at all levels of government to ensure high-quality, cost-effective programs. Despite their best efforts, agencies that lack in-house technical expertise often conflict with basic aspects of managing outsourced digital services, especially given potentially misaligned long-term incentives between agencies and vendors.

To be clear, the scale of the work needed means private vendors will not disappear. Our point, instead, is that governments need more tech capacity to be smart buyers, and managers, of the services they purchase. Governments can outsource the provision of public services but need to maintain enough capacity to engage in mission-oriented innovation, enabling them to engage with vendors as skilled peers rather than naive buyers.²

Our experiences providing technical assistance and conducting research with state agencies illustrate that without in-house technologists, it is difficult to ensure that vendor delivery actually advances government goals. Without the ability to examine their own software and data, agencies struggle to ensure that policy rules are instantiated correctly, to analyze operations and performance, or to experiment to improve processes.

Responsiveness and Oversight Require In-House Technologists

In-house capacity enables government agencies to respond quickly to changes in government goals. The prevailing reliance on detailed up-front contracts hampers responsiveness. Of course, it is difficult for agencies to fully specify what is needed to deliver high-quality services in advance, meaning contracts are incomplete.^{1,5} Agency staff and private contractors often need to iterate on deliverables to best meet program goals. In a pinch, the need to pay for unanticipated system changes slows things down.

The COVID-19 pandemic highlighted the inflexibility of state agencies that lacked in-house technologists. State agencies needed to move quickly to identify those eligible for new benefits programs, such as summer food benefits for children who received free and reduced-price meals. There was not enough time to contract for new systems or services to do this work; agency staff had to make do with what they had and often lacked the experience to take on critical, necessary tasks. For instance, record linkage of data across programs was new to many, and it was clear to them that their false negative rates were too high. One of us worked at a nonprofit at the time and coached state agency

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staff on tasks such as performing data standardization and record linkage using their existing tools. Standardizing unfamiliar datasets and improving record-linkage strategies did not require deep expertise; it simply required a base of experience, a willingness to improvise, and a focus on the outcomes (and the latter was exactly why agency staff were motivated to seek help). The experience reflects a common point of potential failure in crises: unanticipated work that private contractors lacked the incentives to perform and that agency staff lacked the expertise to do.

The effort to issue new benefits during the pandemic also highlighted another common roadblock to government responsiveness: the inflexibility of ecosystems built by entrenched vendors. The mailing of benefits cards for new programs was sometimes delayed by weeks because each state had contracted with a sole vendor to make benefits cards, and these vendors could not print cards quickly enough. Antiquated, closed systems made it impossible for others, such as major credit card companies offering assistance, to step in. 18F helped government agencies to avoid exactly these types of situations.

Toward the end of the pandemic health emergency in 2023, millions of people needed to begin renewing their Medicaid enrollment again. State agency staff asked their vendors to make improvements to better use existing data sources to reduce the number of cases workers would need to manually process. While making these improvements, many were shocked when a bug was discovered in the logic of Medicaid systems be-

ing used in 29 states and DC, whereby the code did not consider eligibility at the individual level, as is required, but at the household level. This led to the erroneous disenrollment of 500,000 people, mostly children (thanks to federal oversight and coordination, this was only a temporary disenrollment).

One reason that seemingly basic errors like these are not spotted and resolved sooner is the absence of agency staff who can read the code operating their systems or even run queries on their own data. In one state where we were researching Medicaid improvements following the pandemic, the agency's ability to monitor new changes was limited to manually defining several tests that reflected program eligibility rules. To understand operations, they relied on reports from their vendor that had not been updated in years; staff and the vendor had little confidence in their meaning. When workers using the system began to suspect that a recent change had introduced errors, they only had anecdotal evidence, which the vendor was able to dismiss. It was only in the context of a research project that we identified, and confirmed with agency staff, a widespread pattern of unusual outcomes that could only be due to a bug.

Case Study: Online Advertising for Social Services

We now dive into an example from one state that demonstrates the challenges in outsourcing technical services without data science and analytics capabilities. In this case, the state agency was running a set of advertising campaigns and reached out to our academic team for help ensuring its

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campaigns were, at a minimum, not exacerbating disparities in participation. The agency had launched the campaign the year prior, which they had outsourced to a private marketing contractor. This outsourcing is part of a larger trend of outsourced government marketing; Deloitte's Government & Public Services, for example, has managed ads for state public services that have garnered hundreds of millions impressions.³

While the relevant agency team staffed experts in marketing and social services, it did not employ anyone with a technical background. We had a front-row seat to the breakdowns that followed.

Data documentation. Without technical leaders, the agency had not known to set expectations for code or data documentation, nor did the contractor create interpretable and accurate documentation for its own use. Without reliable documentation, small errors can snowball into faulty inferences. In one case, a year-long advertising campaign run by the vendor was given a name that referred to *maximizing conversions*—a bidding mechanism for ad campaigns. It was only after several months of analysis and continued questions that the contractor mentioned that our interpretation of the naming convention was incorrect: The campaign had been using a completely different bidding mechanism all along. This fact was known to only one individual on the vendor team and was not documented anywhere. If not for continued requests for ad hoc documentation, this would have led to erroneous conclusions about campaign efficacy, and it reflects the information asymmetry that can plague relationships between vendors and government.

Data collection and monitoring. Data is the backbone of program monitoring. Yet, this agency did not own its data sources. Instead, the private contractor had set up a visualization tool for the agency to view key metrics. If we sought data outside the scope of the dashboard tables, we would submit a request to the contractor, who would then share a static spreadsheet. Any questions or irregularities in the data would require a new request, resulting in further project delays.

Without oversight, contractors are incentivized to cut corners in their technical systems.

Timely data analysis was impossible.

Over the course of our collaboration, the agency recognized that data ownership could improve their efficiency, and they attempted to create a new data pipeline. However, the agency employees responsible for this endeavor lacked the training to ensure the pipeline was operating correctly. Tasks that a data scientist or engineer may take for granted, such as merging tables, instead resulted in dropped records or mis-aggregations of engagement metrics. Without quality assurance or testing processes, these errors could have continued unnoticed.

The agency recognized it lacked the expertise to create a data pipeline, but rather than developing in-house expertise, it considered purchasing a business intelligence product that would—most importantly—provide access to a solutions engineer.

Data manipulation and analysis. Given that the agency did not generally own the data, basic analyses were similarly outsourced. In addition to the dashboard, the consulting firm would share monthly aggregate performance metrics. Supplemental analyses using the attempted in-house data pipeline were susceptible to errors and unit inconsistencies—such as records off by a factor of 1,000—as the agency did not have analysts who understood how to work with the data tables.

The gap in analysis capacity also impeded the agency's ability to drive iterative changes in support of program goals. For example, the agency—upon partnership with researchers—became interested in measuring balance in ad delivery across user groups. This was a technically simple observational task (reporting ad campaign

metrics grouped by demographic), but the agency had no way of knowing how much or little effort this would take. Furthermore, such additional analyses did not align directly with the original commitments of the consulting agency, and there was hesitancy to perform such analyses without clear direction from the agency itself. At the same time, the agency had difficulty specifying exactly which analyses were needed.

Experimentation. Innovation depends upon credible data-informed experimentation. Through observational data analysis, our team identified that ad delivery had not historically been balanced across user groups. As patterns in ad delivery can be subject to many external market influences, we proposed an experiment that would allow us to produce more robust ad delivery metrics across user groups. However, this experiment needed to be implemented by the contractors, who declined to add us (as external researchers) to the relevant ad platform accounts.

As we collaborated with the agency to decide on an experiment design, we discovered that previous experiments and changes to ad campaigns were done in an ad hoc and untracked manner. For example, the vendor would regularly manually adjust the target cost-per-click levels whenever they felt necessary or ran experiments on top of currently running campaigns in a way that induced ad cannibalization. While these decisions were informed by the contractor's domain expertise, they were not documented, reflecting the contractor's prioritization of short-term ad campaign performance over gathering strong evidence to improve long-term outcomes. While a focus on immediate ad volume may be valid in some cases, here it illustrates a misalignment between vendor and agency goals.

We view the case of experimentation as especially important in addressing the *iterative nature* of an agency's program goals. Throughout the process of attempting to conduct an equity assessment, we found that our partner agency lacked autonomy and capacity to monitor results. Furthermore, even when the agency recognized limitations in its ability to effectively monitor



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and outsource advertising, it could not remedy the situation—with the next best option being to seek *separate, additional* contractor support. Without in-house technologists who can specify requirements, inspect implementation, and monitor results, agencies will struggle to manage contractors toward even the most basic new goals.

Government Needs More, Not Fewer, Talented Technologists

In-house technologists are necessary for effective outsourcing of digital services and IT systems. Without oversight, contractors are incentivized to cut corners in their technical systems, such as through poor documentation and data warehousing practices. Costs pile up while everyday opportunities for improvements are overlooked. This can turn into a positive feedback loop, in which the errors and complexities of contractor-provided technical services further obstruct government agency autonomy and beget larger needs for outsourced services with even more contractors and more complexity.

The challenge of sufficiently investing in government technology capacity is not specific to the U.S. Weak oversight and management leading to cost overruns and delays in IT projects is familiar nearly everywhere. We can also look outside the U.S. to find compelling examples of government investment and innovation in IT; one such case is the U.K. Government Digital Service, on which the USDS was modeled.⁶

Yet, the U.S. is a surprising case. Academia and the private sector have

produced tremendous technical capacity outside of government. Despite the role the U.S. IT sector has played internationally, the U.S. was slow to invest in technology expertise within government. Comparatively small bets on capacity, such as USDS and 18F, could recruit talented and experienced technologists willing to take a large pay cut for the sake of public service. These experts recognize the need they addressed, despite how they may have left government; many have since publicly said they feel fortunate to have had the chance to do the work.

We need more, not fewer, technologists going into government to work directly with non-technical domain experts. With the collapse of job opportunities in and around the federal government, graduates from engineering and data-intensive programs curious about public service might instead consider exploring state and local government careers. These roles can offer meaningful opportunities for helping people in their community while also providing a sense of how government works. Hopefully, when the time is right, some of these same individuals may even want to help rebuild capacity in the federal government. **C**

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