

Reflections on Public Service
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Last Friday was my last day at the White House. As I begin my fellowship at Harvard University, I'd like to share my reflections on public service. Over the last decade, I have had the privilege of serving as the U.S. Chief Information Officer in President Obama's Administration, as the Chief Technology Officer in Mayor Fenty's cabinet in Washington, DC, as the Assistant Secretary of Commerce and Technology in Governor Kaine's cabinet in Virginia, and as the Director of Infrastructure in Arlington County. Serving the public and working alongside the dedicated and talented men and women who serve the American people every day, has been the honor and experience of a lifetime.

In his Inaugural Address, President Obama said: "We have duties to ourselves, our nation and the world; duties that we do not grudgingly accept, but rather seize gladly, firm in the knowledge that there is nothing so satisfying to the spirit, so defining of our character than giving our all to a difficult task."

To me, that is the essence of public service. And like many others, my commitment to public service is rooted in my own American story.

I was born in New Delhi, India, and lived in Tanzania until I was eleven. I came to America in 1985, when my parents decided to move to a land of unlimited opportunity built on the premise that all men are created equal.

I couldn't speak English when I first arrived. I recall my first days at school in Gaithersburg, Maryland, and seeing a couple of African American kids around my age. They reminded me of my friends in Tanzania, so I walked up to them and started speaking in Swahili. I was promptly met by strange looks, so I started speaking even louder to make sure they understood me. I suspect they thought I was making fun of them because the next thing I knew, I was being beaten up. Not the warm welcome I was expecting!

But I was fortunate to have access to a good public education and to live in a country where anything is possible if you work hard. And eventually, I learned English by watching "Three's Company" and taking English as a Second Language classes until the ninth grade. I went on to

earn a great college education which opened up my world to opportunities that my parents could only dream of.

For me, public service has been a way to give back to a country that has given me so much. Since I first arrived here as a kid all those years ago, I've been inspired by that fundamentally American notion that no matter where you come from, no matter what you look like or how much money you have, you have a right to dream big and act boldly. It's an idea that's etched into our nation's DNA.

And today, as I reflect back on nearly a decade of public service, I'm once again reminded of what we can accomplish when we harness that American spirit, embrace bold ideas, and work tirelessly to execute them.

I'd like to take you back to when the President was elected in November of 2008. He made technology a central part of his agenda, establishing the first-ever transition team focused on technology, innovation, and government reform. I had the honor of being a part of this team.

Having served in city, county, and state governments, I'd seen firsthand the transformative power of technology and the impact of a government that works effectively for its citizens.

Unfortunately, when people think of the Federal Government, they think of red tape, long lines, and cold, distant bureaucracies. Too often the reins of government slip from the hands of "we the people" to inaccessible and faceless government officials.

And so, from a small, nondescript office in downtown Washington, we spent many long nights fueled by coffee, thinking big about how we could transform our Government through technology. I was ready to embark on a technology revolution in the Federal Government that would crack down on wasteful spending; increase the efficiency and effectiveness of government operations; enable an open, transparent, and participatory democracy; advance the cybersecurity posture of the nation; and most importantly, improve delivery of citizen services.

You can only imagine how excited I was when the President appointed me as the nation's first Chief Information Officer.

On a bright February day, the previous morning's dusting of snow melting on the ground, I arrived at a White House that was, as the Washington Post put it, "stuck" in the "Dark Ages of technology." In their words, "If the Obama campaign represented a sleek, new iPhone kind of future, the first day of the Obama administration looked more like the rotary-dial past."

As my team congratulated me on the new job, they handed me a stack of documents with \$27 billion worth of technology projects that were years behind schedule and millions of dollars over budget. At the time, those documents were what passed for real-time updates on the performance of IT projects. My neighbor's ten year old could look up the latest stats of his favorite baseball player on his phone on the school bus, but I couldn't get an update on how we were spending billions of taxpayer dollars while at my desk in the White House. And at the same time, the President of the United States had to fight tooth and nail to simply get a blackberry.

These were symptoms of a much larger problem.

The information technology gap between the public and private sectors makes the Federal Government less productive and less effective at providing basic services to its citizens. Closing this gap is the key to making government work better for the American people – the ultimate goal.

As I reflect on my time as the U.S. Chief Information Officer, I am proud of how much we accomplished.

The first order of business was to stop the bleeding by cracking down on wasteful spending. The Federal Government is the largest purchaser of IT on the planet, with over \$80 billion spent on over 12,000 systems every year. For too long, we had witnessed runaway projects that wasted billions of dollars and fell years behind schedule. By the time some of these projects launched – if they launched at all – they were already obsolete. With a stack of documents as the best source of information on federal IT project performance, it's no surprise we found out about these failures only after they became newspaper headlines.

But I knew that it didn't have to be that way. Just a few years earlier in Virginia when I was Governor Tim Kaine's Assistant Secretary of Commerce and Technology, I'd seen how technology-enabled transparency could drive performance.

The Governor had established a goal of directing 40 percent of discretionary spending to small, women-, and minority-owned businesses. Yet agencies were self-reporting their progress, making it nearly impossible for the Governor to know which agencies were meeting this goal and which ones weren't.

To help shine a light on the agencies' spending, we built a dashboard that took the raw data from procurement systems to provide a real-time view of progress across all the agencies. When we launched the dashboard, it showed that our spending level was only 16 percent – less than half the goal. The Governor was not pleased, but at least now he knew what we were up against. Using that data, he held individual cabinet members accountable for their performance. And because citizens saw the same data, they were equally engaged in driving change. Within about a year, the number rose above the Governor's goal of 40 percent.

Similarly, to shine a light on the more than \$80 billion in annual Federal IT spending, we launched the federal IT Dashboard in June 2009. The Dashboard is a website where the American people can monitor every IT project in the Federal Government as easily as they can monitor their personal investment portfolios. If a project is over budget, or behind schedule, the Dashboard tells you so – and shows a picture of the person in charge.

But it's not enough to shine a light and hope that results follow.

That's why we used the IT Dashboard to power "TechStat" sessions – in-depth accountability reviews to turnaround, terminate, or halt underperforming IT projects so that we don't continue to throw good money after bad money. Through these reviews, we saved \$3 billion and cut the time to deliver projects in half.

For example, we saved \$193 million by terminating the Department of Justice's failed attempt to develop a unified case tracking system. The project's price tag had doubled since its start in 2006 and it had yet to deliver a useable product.

And at the Department of the Interior, the Secretary couldn't even send an agency-wide email message because the Department's 13 email systems couldn't talk to each other. They were powered by 210 data centers that are being cut down to 115, saving \$500 million.

Now all of the agencies are conducting their own TechStats – and they’re hard at work finding and fixing the problems that plague Federal IT.

To scale this model around the world, we open sourced the IT Dashboard and released all of our training materials. Within hours, 38 states and multiple countries reached out to express interest in adopting it to improve transparency and accountability. It’s already been downloaded more than 2,500 times across the world.

Stopping the bleeding – fixing how we manage Federal IT – was a critical first step, but we knew Federal IT would stay mired in the Dark Ages if we didn’t also embrace innovative, lightweight technologies and leverage shared services.

My ideas of an agile, nimble Government were shaped by the events of September 11, 2001.

It was 8:30 in the morning and I was sitting in an office interviewing for the position of Director of Infrastructure Technology for Arlington County, Virginia. In the middle of the interview, someone knocked on the door and said, “We’ve entered a federal emergency.” Immediately, we turned on CNN and watched in horror the second plane fly into the World Trade Center.

In the tense moments that followed, all of us were wondering what was coming next. And from where I was sitting, in the shadow of the nation’s capital, within sight of the Pentagon, I asked myself if we were prepared for the worst. Could the Government be run virtually, without relying on a centralized, dedicated physical infrastructure?

Eight years later, serving across the Potomac in the White House, circumstances of a very different nature further shaped my thinking on the need for agility in Government.

With the economy facing the worst recession since the Great Depression, one program – Cash for Clunkers – provided rebates to people who traded in older cars for new, more fuel-efficient ones.

But just three days after its launch, the system for processing these rebates collapsed under the weight of an unexpectedly large wave of applications – overall, a total of 690,000 applications came in, nearly three times the anticipated amount. Lacking the ability to scale rapidly, the system was overwhelmed. For a month, we rode a roller coaster of unplanned outages and

service disruptions, leading to delays in processing rebates. Upset citizens stood in long lines as they waited hours for their paperwork to be processed.

One hot DC August night during the height of this mess, I emerged at 4 a.m. from the Department of Transportation after 14 straight hours working with the system architects and database engineers as they struggled to keep servers online and the site operational. As I wandered the streets of DC, I was frustrated that I couldn't catch a cab, but I was even more frustrated that technology was complicating the lives of thousands of Americans. I knew that if Cash for Clunkers had used cloud services, the site would have easily been able to scale in response to the rising demand.

That's what drove home my belief that we had to move the government to the cloud.

I instituted a "Cloud First" policy to accelerated the safe and secure adoption of cloud computing and focused on shifting up to \$20 billion worth of federal IT spending to cloud-based solutions. Ultimately, this will allow the Government to better serve the American people and focus on mission-critical tasks instead of on purchasing, configuring and maintaining redundant infrastructure.

Every federal agency is now moving to the cloud. And the results are exciting. For example, the Securities and Exchange Commission made it easier for investors to report fraud by launching a new case tracking system in the cloud. This new, paperless system is more reliable, efficient, and accurate than its predecessor, allowing investigators to close out cases up to 75 percent faster. And the Department of Agriculture and the General Services Administration are saving \$42 million over the next five years by moving email services to the cloud. To encourage this on a broader scale, GSA issued a procurement worth up to \$2.5 billion that pools purchasing power government-wide and makes it easier for agencies to consolidate collaboration systems.

At the same time that we moved to the cloud, we also took on a fragmented, duplicative infrastructure that had allowed thousands of redundant applications to sprout like weeds, costing us billions of dollars.

When I was Director of Infrastructure Technology in Arlington County, I knew down to the street address where each of our data center facilities was located and what was in them. Yet

when I asked how many data centers the Federal Government had, nobody could give me the answer.

It took agencies eight months to produce an initial inventory of their data centers. All told, the number of Federal data centers has more than quadrupled since 1998, from 432 to more than 2000. Yet on average, they are only 27 percent utilized. This means that 73 percent of our computing power is doing nothing for the American people.

That's why the Federal Government is actively shutting down 800 data centers by 2015. Already, 81 have been shut down and a total of 373 will be closed by the end of next year.

A great example is right here in our backyard – the Department of Health and Human Services operates 175 data centers. They recently shut down one in Rockville, Maryland that was approximately 15,000 square feet and cost taxpayers \$1.2 million annually in electricity costs alone. It's one of 12 they're shutting down this year.

Reducing the Federal Government's reliance on what we call "Big Iron" and shifting to the cloud not only frees up resources so federal agencies can focus on mission-critical activities, but also reduces the Government's overall energy and real estate footprint and can improve its IT security posture.

And in a world where new threats arise daily, we must focus on improving cybersecurity for the American people, our Nation's critical infrastructure, and the Federal Government's own networks and computers.

Yet too often this focus on security has been used as an excuse to prevent the government from adopting the sort of innovative technologies that could better serve and engage the American people. What's true is the inverse: Done the right way, using more nimble, flexible, modern technology enhances security by freeing the government from decaying infrastructure and custom-made applications written in obsolete computer languages even pre-dating the personal computer revolution.

Consider how the government has historically secured IT systems – through report writing. Over a six year period, the Department of State alone spent \$133 million amassing a total of 50 shelf feet, or 95 thousand pages, of security documentation for about 150 major IT systems.

This works out to roughly \$1,400 per page on paper “snapshots” that are, at best, outdated a few days after being published.

Just as a stack of documents wouldn't help us solve vexing IT management problems, we can't rely on them for security. That is why we shifted away from paper-based reports to real-time data feeds that enable continuous monitoring and remediation. This means that agencies can identify vulnerabilities faster and actively protect against attacks. To address the structural issues that get in the way of meaningful progress, we developed a comprehensive approach to address the cybersecurity needs of our nation through model legislation.

This model legislation focuses on three key areas: Safeguarding the personal data of the American people and enhancing their right to know when it has been compromised; protecting our national security by addressing threats to our power grids, water systems, and other critical infrastructure; and helping the U.S. government protect our federal networks, while creating stronger privacy and civil liberties protections that keep pace with technology.

When a bank's account records are hacked, or a company accidentally posts customer information in an insecure forum, the exposure of sensitive personal information can put Americans at risk for identity theft and other harms. Time is of the essence in such cases – the sooner you know about a data breach, the sooner you can notify customers and take preventive measures to limit the damage.

Currently, we have a Byzantine patchwork of 47 different state notification laws. Streamlining these into a national policy would simplify and strengthen reporting requirements, not only ensuring that notifications reach all affected Americans, but also incentivizing organizations to have better data security in the first place. Whether we're talking about Government IT spending or private sector data breaches, sunlight remains the best disinfectant.

From power plants to stock exchanges, hospitals to banks, our Nation's critical infrastructure systems are increasingly wired and, as a result, increasingly vulnerable to cyber-attacks. Whether these systems are privately or publically owned does not change their importance to our economy and national security. That's why we want to strengthen the criminal penalties for hacking into these systems, and find ways for companies and the Government to voluntarily share information about cybersecurity threats and incidents without compromising privacy.

And finally, to help protect our federal IT systems against the ever-present threat of cyber-attacks, we want to allow the Department of Homeland Security to implement new intrusion detection and prevention systems that can help speed our response to these incidents. To ensure that cybersecurity technologies are used for their intended purpose and nothing more, we have designed a framework for protecting privacy and civil liberties that includes new oversight, reporting requirements, and annual certification.

In this approach we also need to be mindful, however, that security is used too often as an excuse to justify the Government operating in a closed, secretive, and opaque manner. So even as we work to advance the cybersecurity posture of our nation, we can't allow security to be a barrier to innovation and to engaging the very people we serve.

Given the challenges that our nation faces, we must find the innovative path by tapping into the ingenuity of the American people and leveraging the best, consumer-grade technologies.

When I was the Chief Technology Officer of Washington DC, the emergence of consumer technology had dramatically raised citizens' expectations of the services they could get from their Government. If you could use your phone to make a reservation at a restaurant, why not also check whether you could park there for free before leaving for dinner?

But in a climate of declining budgets, I knew that business as usual – throwing more Government resources at the problem – wasn't the answer. We almost have an IT cartel that's made up of a few companies that benefit from government spending because they understand the procurement process better than anyone else, not because they provide better technology.

I wanted to find the innovative path and mobilize an army of citizen-developers who didn't need an office in City Hall or a PhD in the procurement process to get work done for their Government.

So we threw open DC's warehouse of public data so that everyone – constituents, policymakers, and businesses – could meet in a new digital public square. We started with 200 live data feeds – everything from government contracts to crime statistics to economic development. And to spur citizens to turn this data into applications that the government didn't have the resources to create on its own, we launched the "Apps for Democracy" contest, offering prizes for the best applications based on the data we released.

Within 30 days, our \$50,000 investment in the nascent “app economy” produced 47 applications – applications that would have cost about \$2.6 million to develop traditionally.

So it was with this experience in mind that I launched Data.gov to democratize data across the Federal Government and tap into the ingenuity of the public to develop tools that help the American people.

We ran Data.gov like a lean start-up. On day one, we launched with a Minimum Viable Product with only 47 datasets. Two years later, there are 389,907 datasets covering every government mission area, from health care to public safety.

Innovators from across the country have been busy putting the datasets to work. So far, hundreds of apps have been created.

One app helps you select the right hospital when seeking treatment. It uses data from the Centers for Medicare & Medicaid Services to compare the cost and effectiveness across hospitals for various procedures, from knee replacements to neonatal care. It also provides results of patient surveys on things like how clean the rooms are, how quiet the hallways are, or how helpful the nurses are. Another app uses data from the Federal Aviation Administration and the Bureau of Transportation Statistics to help travelers pick the best days and times to fly. The app uses data from more than 11 million flights, covering 303 airports, and 19 different airline carriers to analyze performance of airports by day of week and time of day, and assess airline carriers by flight route and travel time.

And Data.gov has spawned a global movement – 21 nations, 29 states, 11 cities, and several international organizations have established open data platforms. So in the coming months and years, we will see an explosion of apps based on open data platforms across the world.

To hardwire this citizen-developer approach, we worked with Congress to pass the America COMPETES Act which grants agencies the authority to use prizes and challenges to spur innovation. And we are now seeing the results of the competitions across the Federal Government. Through the “Apps for the Army” competition, soldiers and army civilians created apps to support physical training, mental health, and disaster relief. Through the “Apps for

Healthy Kids” challenge, innovators across the country created fun and engaging software tools and games that drive children to eat better and be more physically active.

Recently, the Environmental Protection Agency (EPA) announced its “Apps for the Environment” competition, challenging developers to come up with the best, most innovative ways to use publically available data to help the EPA advance goals like improving air quality and protecting citizens from toxic chemicals.

The ultimate goal is to improve the delivery of government services to the American people by making it simpler, easier, and faster to access services that help them in their daily lives.

New parents should be able to confidently buy a crib for their new baby without worrying whether they’ve made a safe choice. That’s why we launched a mobile app that allows parents to walk into any store, scan a barcode on an item like a crib or a toy and pull up instant information on product safety recalls.

Veterans should be empowered to take control of their health care. That’s why we made it easier for them to access and download their personal health records anytime, anywhere.

Applicants for citizenship shouldn’t be left in the dark about the status of their immigration cases. That’s why we launched an online case tracking system that lets them track their status just by entering a number, as they would a FedEx shipment.

We live in the Information Age, yet for too long the Federal Government has operated in the Dark Ages of technology. As I reflect on my time serving in the Obama Administration, I am proud of the work done to close this gap: We saved billions in taxpayer dollars; we adopted game changing technologies; we strengthened the cybersecurity posture of the nation while making it more open, transparent, and participatory.

We have shown that it is possible to change the status quo. But we must remember that nothing is immune to the laws of physics, especially entropy. Left alone, things tend to move from order to disorder – and the hard work this Administration has done to reform Federal IT could fall back unless we keep our shoulder to the wheel.

Having served in Government for nearly a decade, I know that real progress is never about any one policy, one program, or one person. From Arlington County to the State of Virginia to the District of Columbia to the White House, I have had the privilege of working shoulder-to-shoulder with many of the talented, dedicated, and hardworking individuals who serve our nation tirelessly.

It has been the experience of a lifetime to have served as the country's first Chief Information Officer, and I have been deeply honored to serve in the Obama Administration as we worked to deliver results for the American people.

I look forward to continuing my work at Harvard, focusing on how we can use information technology to solve our nation's and the world's most pressing problems. We live in historic times – facing an unprecedented global economic crisis and new threats to our national security that change daily. Used wisely, technology can help us confront these challenges, but it will require all of us – the public sector, the private sector, and academia – working together to build a brighter future and lead us to a better tomorrow.

I'd like to leave you with a few words from President Teddy Roosevelt. These words have served as my north star throughout my career. I have carried them in my wallet since I started in public service nearly a decade ago.

“We are face to face with our destiny, and we must meet it with a high and resolute courage. For ours is the life of action, of strenuous performance of duty; let us live in the harness of striving mighty; let us rather run the risk of wearing out rather than rusting out.”