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Machine Learning in Government: Saving Time, Money and Maybe Even the World

Detecting billions of dollars in fraud, tracking population trends across the country, and achieving accelerated savings and safety in federal operations: These are just a few examples of machine learning use cases in the government. The efficiencies and effectiveness agencies can achieve using their own volumes of data hold immense promise for government missions and taxpayers alike.

So why is public-sector machine learning—and its omnipresent companion buzz-phrase, artificial intelligence—still limited to small pockets of adoption? While many federal, state, and local officials talk extensively about ML's potential, only a fraction of them are actually implementing the technology.

The reasons for this include limited experience with the technology, silos of data, and limited amounts of pre-labeled training data. Fortunately there is good news. Today adoption is easier than ever with access improving ML tools, growth of expertise in the community, high-profile use cases, and continued examples of effectiveness.

At the Census Bureau, researchers and analysts are using the agency's troves of data to estimate survey response levels, more accurately categorize businesses, and estimate populations based on satellite imagery. The IRS and the Centers for Medicare and Medicaid Services are looking to ML and AI to uncover and mitigate billions of dollars in fraud. In the U.S. Navy, naval aviators are using ML-based predictive analytics to track and manage aircraft maintenance.

These applications of ML are a microcosm of the technology's ability to serve diverse missions and agencies, and there are a few things they and other successful use cases have in common.

THEY OFTEN FACE SIMILAR HURDLES, ESPECIALLY STARTING OUT.

First, there's the funding aspect: Investing in ML requires a budget, and a budget requires justification. While some scenarios offer clear returns on investment—billions saved by thwarting waste, fraud, and abuse; dangerous insider

threats eradicated from national security systems—in most cases, proven success can take time and investment.

There are also challenges in securing the right in-house talent to implement and run these technologies, and achieving buy-in at all the necessary levels can be difficult. Without a high-level ML champion, initiatives will struggle to launch. And without real understanding and shared vision of ML capabilities at all organizational levels, progress can lose momentum.

Across sectors, the vast majority of organizations struggling with AI/ML adoption face major cultural challenges around people and processes, including in institutional alignment, lack of agility, and active resistance. We have observed that working with a partner who has access to the right talent, executive leadership, and multi-level buy-in are major factors of making ML adoption successful for any agency.

THEY PUSH THROUGH BY UNDERSTANDING AND BELIEVING IN THE WHY.

The first thing successfully ML-enabled agencies do is get educated—if possible, by a top-notch industry partner pushing the technological edge. By evaluating current use cases, talking through the agency-specific landscape, defining the next levels, and charting a path that includes how and why ML is the answer, the steps toward modernization take shape. Understanding what that agency is doing today and how their mission can be done better is foundational for building an ML-powered enterprise. It also builds consensus around "why" ML is the right choice.

The Census Bureau, like many government agencies, runs on quantities of existing processes and legacy workforces—so making such a significant transition is time-consuming and a big lift. High-level sponsorship and tying the changes to the right missions are two of the most important aspects of pushing through barriers.

THEY HAVE THEIR EYES ON THE FUTURE.

Three years ago, baking in ML tools and technologies to agency policies and processes wasn't even possible. But in a short amount of time, a lot has changed. What's available today makes it faster to get going, and making it more attainable has catalyzed adoption.

Accessibility also spurs innovation and fosters proactive approaches to solving mission problems.

At Naval Air Systems Command, prescriptive maintenance based on hours flown and similar data has traditionally dictated maintenance schedules. But maintenance based on predictive analytics helps more accurately identify wear and tear on parts of jets and airframes before they break, so officials can more strategically schedule downtime for maintenance. Similarly, in oil and gas, rigs undergo maintenance after a given number of hours—but now operators can automatically monitor parts for signs of break down, schedule maintenance, and order parts in advance. This amplifies efficiencies and reduces downtime.

The future is also high priority at NASA, where the agency's high-performance computing generates mass amounts of data with nearly endless applications. Spotting future trends, improving modeling and simulation, monitoring spacecraft health, planning future missions, linking solar storms to sea life events, tackling wildfires and flooding—the possibilities are virtually limitless.

These examples and guidance underscore the sheer extent of ML's potential impact for the government. While this technology won't protect lives or save the world in every single application … it will in some cases. And it's just the beginning.

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