

Cognitive Enterprise: Transforming Delivery of Government Services

By Andrew Fairbanks



My favorite place to take my daughters when they were growing up was the Sony Wonder Technology Lab in New York City. The museum had a display case that included every step in the evolution of each of their core technologies: music players, cameras, phones. You could see in one 50-foot case the progression from Alexander Graham Bell's first telephone to the rotary dial phone to the first cell phone (all nine pounds of it) to current nanotechnology. It provided a fascinating "fossil record" of the fact that at each 10-year interval, we made significant transformations in technology that transformed the power and impact of technology and its impact on civilization.

Today we are in the early stages of the next step in the evolution of technology. The rapid maturation of artificial intelligence, machine learning, and sensor technology is enabling organizations across all sectors to exponentially improve the effectiveness and efficiency of their operations. Just as the advent of mobile technology changed the ways in which we communicate and digital technology changed the ways in which we take pictures, create videos,

and experience music, the implementation of "cognitive enterprise" technologies are now transforming the ways in which products are created and services are delivered.

Opportunities for Change

The government sector is one of the ripest markets for adoption of the cognitive enterprise. There are numerous use cases in which cognitive technologies can radically change the ways in which services are delivered, improving mission effectiveness while simultaneously reducing cost to taxpayers. These opportunities cut across the spectrum, from defense and homeland security to benefits administration and grants.

In the world of defense, the United States government is standing up the Joint Artificial Intelligence Center (JAIC) to explore, pilot, and deploy artificial intelligence to enhance mission readiness, improve efficacy of operations, and streamline administrative processes. Services and combatant commands are using sensor data, weather data, algorithms, natural language processing, and image recognition



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to change the ways in which they conduct predictive maintenance on their weapons systems, train and deploy personnel, execute supply chain transactions, and conduct war gaming exercises. The use of unmanned aerial vehicles and driverless land vehicles enables the military to greatly expand its impact, while reducing manpower needs and risk to military personnel.

In the world of homeland security, the application of artificial intelligence to video and image recognition is enabling the Transportation Security Administration (TSA) to improve the quality of its vetting of crews and passengers and its searches of baggage for dangerous contraband. The Federal Emergency Management Agency (FEMA) is able to use weather and sensor data to better predict and mitigate risk of damage by flood and fire. And Customs and Border Protection (CBP) agencies are able to apply biometric data to significantly improve the efficiency of border control processes.

The use of natural language processing is also enabling agencies to create automated help desk agents that enable employees and citizens to get quick and accurate answers to questions that previously required long hold times or inconvenient visits to field offices.

Healthcare is also being transformed by artificial intelligence. Systems such as Watson are able to ingest massive amounts of literature and research. The system can then be trained to analyze the information and provide insight to experts that improves diagnosis accuracy and speed. This capability augments physicians and researchers and has the potential to drive significant breakthroughs in medicine and improvements in medical care.

And in civilian agencies, the adoption of artificial intelligence to provide citizen self-service and automated reviews of application for social services and benefits is significantly reducing the backlog of benefits claims and improving the ability to detect and reduce fraud. The technology is also

enabling the automation of labor-intensive processes, which significantly reduces taxpayer costs and expedites reviews.

Ethical Considerations

The era of the cognitive enterprise is upon us and presents great opportunities for transforming the delivery of government services. We are at a moment that is analogous to the move from the Sony Walkman and Boombox and the move from the Polaroid camera to the digital smart phone. The application of cognitive technologies will change the ways in which government services are delivered in profound ways.

But unlike the worlds of music and photography, there are important ethical considerations that we must consider as we apply cognitive technologies to the delivery of government services. We must recognize that the move to automate can displace jobs; we must be mindful that the use of sensors and pervasive video can impede on individual privacy; and we must be aware that the application of technology to automate decision making in certain defense and intelligence functions without human intervention can lead to disastrous outcomes. We need mechanisms in place to ensure that we reap the advantages of these transformative technical innovations, while mitigating the risks of the unintended consequences.

Leadership's Role

To realize the full potential of cognitive technologies in the public sector, we need leaders in government and industry who do two things well. First, we must adopt a creative mindset to “imagine a world in which . . .” We need people who understand our core mission and who understand how cognitive technologies work to develop use cases and narratives for how missions and processes could be transformed through the use of artificial intelligence, machine learning, and other cognitive technologies. And secondly, we must approach decisions from an ethical posture—taking the time to understand the intended and unintended consequences of their actions to make sure that we are acting responsibly.