

The image features a hand holding a glowing lightbulb. Inside the lightbulb, there is a stylized brain with glowing white lines, several black gears of various sizes, and a white funnel-like structure. The background is a warm, orange-toned gradient with a network of white dots and lines, suggesting a digital or neural network. The overall theme is artificial intelligence and innovation.

The Government AI Toolkit

The possibilities for the machine-augmented future are endless — but while artificial intelligence has become ubiquitous in the commercial world, its adoption in government has been slow. This toolkit will help agencies identify the necessary steps to embark on an AI journey — and provide tips for government innovators to easily progress from crawling and walking to the running stage with the technology.

Part 1

Organize Your Data for AI

Collect

An AI journey always starts with the data. And that first step can be very uncomplicated. “Start very simple and take a look at all the data,” says John McBride, North American sales leader for data governance management solutions at IBM. “By collecting and cataloguing that data, you’ve completed your first step on that AI journey and figured out what data is actually useful.”

This phase requires an understanding of the data. Agencies should take a close look at the data — and make it simple and accessible. Is this data correct? Are all the fields filled in? Is this populated correctly? Is this the right format? Does everything check out? As agencies bring in different data sources, they also need to capture what that data means.

Organize

This is a stage where agencies decide which format the data should be in and then move their information into, for example, a data warehouse or lake. “This is where you should be able to not only show where the data came from but every step of the journey backward, so you are able to trust that data,” McBride says.

Classify and categorize data to create an analytics-ready foundation. Examine the data to see if it’s unstructured or structured. Where does it come from — emails, call centers? Does it come from external, internal or third parties? Does the data originate from outside the firewall? Agencies need to be able to answer all these questions, says John Thomas, distinguished engineer and director in IBM’s Competitive Project Office.

Agencies also need to know whether they’re working with good data and then figure out how they can find the data sets they need to do the intended analysis, he says. Consider how good the data is and who owns the data. And can I understand the patterns in that data and be able to predict what happens?

The data can be bad for several reasons. It could be erroneous (faulty sensors), malicious (a hacker injected bad data to skew results), self-selecting (Twitter users are left-leaning and therefore aren’t a representative sample of the true populous), or biased (modeled with data dominated by photos of white men).

Analyze

To trust your data, you'll need to establish governance around it. It's crucial to make sure the people who shouldn't have access to the data don't. Having data flow like water to the right people is great, but terrible things can happen if sensitive information falls into the wrong hands.

It could be as simple as figuring out how to get the right data to the right people at the right time. It's important to establish a process that's repeatable — and have a leader who's responsible for driving this effort forward. It doesn't necessarily have to be a technologist, but it should be someone who understands what needs to be done in order to have a successful governance model in place.

As with any new technology, make sure you don't get distracted by the so-called shiny object syndrome. Identify what the problem is that you're trying to solve. You don't want to use AI for AI's sake. Having an end goal and vision of success in sight will help ensure a smoother start and finish.

“It has to come from a level in the organization that carries weight,” McBride says.

Infuse

With this foundation, you can confidently operationalize AI throughout the business. Tag teaming with a machine allows experts to be more effective and faster. In this case, AI is much faster at sifting through vast troves of information and data, and process complex challenges in a much more condensed timeline than their human counterparts. With augmented intelligence, data-based models and simulations, analysts will have a better grasp of what's coming down the pike — and know how to mitigate negative outcomes or take action before an issue becomes a problem.

But with AI, getting the right answer or the desired result isn't all there is to it. Practitioners will need to understand how a decision was made. Having transparency will help avoid bias in data models and make data core to what government agencies do every day.

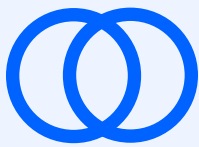
Part 2

Common Pain Points to Overcome

AI is driven by data. And the good news for agencies? Most of them are sitting on massive amounts of data.

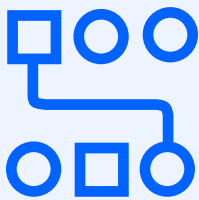
But the question is: Can you truly leverage the data, and can you trust it before embarking on an AI journey?

“They want to be able to verify and audit the data,” McBride says, “and answer, ‘here’s how we came up with the results.’”



Shun data mashups

As for things to avoid, don’t mash data sources together and hope to end up with good results. This practice has been done for the past 20 years and should be avoided, McBride says.



Avoid too many solutions

Another common practice full of pitfalls is trying to piecemeal data science solutions from multiple vendors. That makes it harder to connect all of the systems and deploy quickly.

“We’re about a unified approach,” says Kyle Ferraioli, IBM’s federal sales leader for data science and analytics. “We are, in our way, not only making it easier to deploy solutions to microservices, but we’re also connecting with other vendors in the open source community.”



Don’t see it as a sprint

Above all, you should think of AI not as a one-off effort.

“It is a journey, and it is a continuous journey,” McBride says. “You don’t get to AI without continuously improving it, utilizing it, adding more data to it, so it’s a journey that never ends,” McBride says. “But it will make the agency or organization much more impactful, long-term and strategically.”



Don’t think AI requires techies only

Finally, don’t be intimidated and think AI is just for the data scientist or the technologist.

“You don’t have to be a technologist to actually be able to use AI in your day-to-day work,” McBride says. “I would say one of the misconceptions is when people think about AI, they think, immediately, data science. That is not necessarily true. It doesn’t have to be somebody sitting in a room, building models.”

Part 3

Data Analytics Boost Visibility of Global Health Supply Chain

The U.S. Agency for International Development's Global Health Supply Chain Program is a collection of eight critical projects that support work around the globe to cultivate stronger, more robust health supply chains. The program's Procurement and Supply Management initiative buys and delivers essential health supplies such as drugs and laboratory equipment, to over 60 African countries. These commodities help combat HIV/AIDS, malaria and emerging public health threats, such as Zika and Ebola.

The project also supports family planning, reproductive health, maternal health and child health efforts. To do so effectively, GHSC-PSM incorporates commercial tools, techniques and approaches and adapts them to the low-resources settings in which the project operates.

The challenge

One of the main challenges faced by project planners was having visibility into where health commodities are in the supply chain. Speed is important — many of these products have shelf lives, so ensuring they reach the destination in a timely manner is key. Outdated medicine or missed shipments pose a significant financial risk to USAID.

"Once they come off production from the manufacturing plant, the clock starts ticking, and a lot of these countries will say, 'we need to have at least 75% remaining shelf life on the product when it gets to a country, or we won't accept it,'" says Mike Piatak, IBM's supply chain project executive.

The program gets graded on what's known as "on-prem" delivery. When countries place orders through the program, IBM has a three-week window to work within, or that shipment is deemed late. As part of its contract, IBM has to ensure at least 80% of deliveries are "on prem" within that time window, Piatak says.

Before IBM stepped in to help, on-time delivery was about 20-30%, and the company was asked to come in and boost that number to 80% or better.

The solution

IBM had to start from scratch with the **Collect** step. This enabled the company to stand up a new organization, systems processes, procedures and metrics, all of which created the starting environment.

To make sure deliveries were being made on time, program executives needed more visibility into the supply chain. IBM offered up its WebSphere Commerce, a software platform framework for e-commerce, which allows program officials to track the whereabouts of orders over a 6-9 month timeframe. Then, the analytics tools look at the orders to make sure they reach the countries in time with the correct amount of shelf life.

To implement the **Organize** phase, IBM and its commercial partners implemented a state-of-the-art management information system called Automated Requisition Tracking Management Information System, or ARTMIS. The system uses the best-in-class commercial off-the-shelf software suites used by nine out of 20 top retailers in the world.

The system distinguished between good and bad data by providing end-to-end, real-time visibility into the global supply chain, primarily to the central medical store in each country, to ensure immediate transfer of information and to enable evidence-based decision-making. In short, it offers three distinct advantages: a user-friendly interface for ordering; supply chain analytics to drive better decisions; and a proven, off-the-shelf management information system hosted as a service.

ARTMIS' integration of a logistics management information system and a financial management information system provides comprehensive, real-time information on the logistical data corresponding to all orders and shipments in the system. It also gives visibility into the associated financials for USAID, as the agency receive monthly automated statements across all locations in which the project operates. It makes sure the **Analyze** stage is completely and continually addressed.



The outcome

Using the data visualization and analytics tools as well as new processes implemented to leverage these technologies, commodity managers were able to go through order by order to make sure deliveries of life-saving medicines and other commodities stayed on time.

Part 4

Fighting Fraud with AI

Another federal customer that handles health care deployed IBM's machine learning and analytics tools to identify hundreds of millions of dollars in health care fraud every year. That customer is now working with IBM to develop an integrated AI solution that can build upon the agency's existing analytical environment and infrastructure, Ferraioli says.

The challenge is the agency has multiple databases — including open source and relational databases, internal and external data sources — and an on-premise data center as well as a third party cloud environment. As such, it was critical for them to **Avoid Too Many Solutions**. Plus, different data science skills and abilities exist across the agency. While some data scientists prefer to work in pure-open source, others in the agency prefer a less technical approach to modeling.

“Additionally, some models are running on a data scientist's desktop and some models are in agency's production server environment, so it's clearly fragmented,” Ferraioli says.

IBM's challenge was to help this agency modernize to a cutting-edge AI platform while integrating with the existing tools, environment and intellectual property developed by the agency over the years. This had to be done with zero downtime.

With IBM's help, the agency is aiming to provide a platform for its data sciences regardless of skill level. Instead of **Thinking AI Requires Techies Only**, from a database and a data science standpoint, users can now collaborate with each other, push models into production faster and deploy the latest AI capabilities from IBM research in a few clicks, Ferraioli says.

The agency is working toward its goal of a unified data science and database approach as well as progressing from data mining to automation in AI.

