

INTERVIEW • TAKA ARIGA - Chief Data Scientist Director, Innovation Lab, US Government Accountability Office

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1. Public policy decisions based on Artificial Intelligence have been gaining ground. This scenario offers several risks, especially those about the decision quality. Considering the context for pressuring public authorities' commitment to reinforce policy-based decisions in evidence, what is the GAO doing about this scenario?

[Taka] While the use of artificial intelligence is rapidly transforming wide-ranging public sector missions, implementations of AI solutions by governmental entities necessarily need to be held to a higher standard of accountability. This is because AI-based decisions can have outsized and opaque impacts on the society. Certainly there are complex technical and data science challenges that need to be appropriately addressed in order to deploy effective AI systems. They include challenges with data quality, machine learning performance tuning, operational integration, and cybersecurity resiliency. However, governmental entities often have to grapple with other non-technical concerns such as regulatory compliance with privacy and civil rights statutes, availability of a workforce with adequate digital skills to interpret outputs that are based on probabilities, and inflexibility of acquisition processes, just to name a few. Bottom line, implementing AI solutions within the public sector context is complicated. Over the past several years, there have been a concerted push towards implementing responsible AI—meaning that outputs should be explainable, policy decisions made based on AI results should be transparent, and use of AI should not promulgate disparate impacts. These are certainly worthwhile ideals towards accountability. That being said, these efforts towards responsible AI often are expressions of qualitative aspirations that lack sufficient details to implement. This is why the Government Accountability Office published first-of-its-kind AI Accountability Framework to help

inform governmental agencies on specific practices that can verifiably demonstrate accountability. These practices cover the spectrum of AI lifecycle and span across four pillars—governance, data, performance, and monitoring—at both organizational and system component levels. GAO auditors and others within the oversight community are using this framework as a blueprint to conduct evidence-based evaluations of AI implementation across governmental entities. In short, independent verifications is key towards making sure that aspirations of responsible AI manifest into reality. Because AI is becoming ubiquitous, GAO expects governmental agencies will continue to confront complex implementation challenges. Our goal is to make sure that oversight capacity continually evolve alongside at the speed of advances in machine learning, data engineering, and other related disciplines. Link to the GAO AI Accountability Framework is at: <https://www.gao.gov/products/gao-21-519sp>.

2. Has the GAO made evaluations about specific AI algorithms applied by public agencies or third parties in policy process? What were the challenges and the results?

[Taka] While GAO has the technical capacity to evaluate individual machine learning models and related artifacts, our oversight work typically do not opine at the algorithmic level of details. GAO's goal is not to zoom into and unpack complexities of individual ingredients but rather assessing an AI program holistically for effectiveness, efficiency, economics, equity, and ethics. To that end, GAO's growing body of oversight, insight, and foresight work related to AI can be found on our website at GAO.gov. In addition, GAO has done work highlighting systemic challenges such as the need for more digital

talents within public sector workforce, implementation of zero trust cybersecurity controls, promoting an innovation economy, and acquisition difficulties. Since the publication of GAO's AI Accountability Framework in summer of 2021, GAO auditors and others within the public sector oversight community have relied this blueprint to conduct evidence-based evaluation of AI programs across governmental entities. The Framework itself is purposefully grounded in the language of the Yellow Book (a.k.a., Generally Accepted Government Auditing Standards) and the Green Book (a.k.a., Standards for Internal Control in the Federal Government) which affords a baseline familiarity of key accountability concepts for the auditors.

3. How does the GAO relate to the academia? Is there an internal policy for the development of the skills and knowledge of its staff about data science and artificial intelligence? Is there any department that monitors and incorporates scientific knowledge into GAO procedures?

[Taka] Academic institutions are invaluable sources of experimentations that help to continually push boundaries of AI capabilities. The challenge is figuring out how to bridge capabilities based on research and theories with applied implementations that need to happen in the real (imperfect) world. GAO's Innovation Lab staff routinely review research papers on the latest advances in data science as we build our own AI solutions. Auto-summarization of texts and data-sparse machine learning models are two exciting recent examples that come to mind. In addition, GAO makes a significant level of training resources available to our staff, including online skill development, subscriptions to technical journals, attending conferences, and participating in knowledge exchange discussions with external stakeholders. As we experiment with new machine learning techniques, we carefully evaluate performance potential alongside weighing our ability to train/tune them for GAO use cases. We also frequently dialogue with academic institutions, think tanks, advocacy groups, and international stakeholders on evolving policies and accountability issues related to AI and other emerging technologies. These collaborations help us mitigate blind spots, anticipate changing landscapes, and strengthen our oversight capacity.

4. What is the role of artificial intelligence in GAO's routine? If possible, go through the following aspects in your answer:

- **the use of artificial intelligence in the evaluation of public policies.**
- **AI solution typologies for your business: internal development or through acquisitions? Are you following some framework for this?**
- **use of artificial intelligence in inspections.**
- **human role in guiding artificial intelligence on GAO**

[Taka] As a congressional watchdog, it is important for GAO be a hands-on practitioner of AI so that we can rely on our own experience to independently conduct evidence-based evaluations. After all, that is our core belief of trust but verify. In practice, this means that our growing teams of data scientists focus on custom design, development, and deployment of our own AI solutions for use in audit contexts. This approach allows GAO to explore and combine different machine learning and modeling techniques while enabling a complete control over parameter tuning, workflow designs, operational integration, and compliance towards federal information assurance requirements. This level of flexibility is typically not afforded by commercial AI products, which in turn hinders our ability to meet specific audit quality standards such as conducting detailed code reviews and drafting technical records of analyses. Moreover, commercially available AI products are typically trained using commercially available or open-source data, which often do not perform effectively under characteristic of governmental data. It is important to note that GAO's AI ethos is that humans must always be in the loop and never out of the loop. In other words, we develop AI capabilities only as augmentations of audit procedures and never to supplant professional judgements. GAO is concurrently moving forward with agency-wide data governance and data literacy efforts to make sure our multi-disciplinary workforce can effectively govern, operate, scale, and interpret AI capabilities.

5. How do you see the advances of artificial intelligence for corruption prediction and mitigation?

[Taka] While the use of AI to combat corruption and fraud risks is an active area of research within the data science community, significant technical and design challenges remain for appropriate use in oversight con-

texts. Generalized analyses are extraordinarily difficult because details related to corruption and fraudulent activities are typically sparse, and often associated with particularized circumstances. It is also unfortunate that this is a market space with much hyped promises. I do see tremendous potential in the use deep learning techniques and graph-based databases to surface anomalies that may indicate corrupt or fraudulent practices. However, while deep learning may produce compelling results, the outputs are nearly impossible to linearly explain, which in turn, poses roadblocks toward substantiating findings within audit contexts. GAO's Innovation Lab is actively exploring prototype use of graph databases and looking at how we might unlock a new class of machine learning capabilities that can be appropriately integrated within audit procedures.

6. Is there any government innovation based on artificial intelligence that you wish to point out for us?

7. How is the Data Science (DS) process, including Analytics and AI tools, at the GAO?

If possible, go through the following aspects in your answer:

- data literacy for the audit workforce.
- data governance.
- availability of DS projects to internal and external stakeholders? (management panels, academic events, ...).
- Examples or ideas of Data Science, Analytics Tools and AI projects that add more value to the Government? (Continuous Auditing, predictive models, pattern identification, ...)

Examples of using new technologies (Blockchain, Network-Graphs, Cloud,) to improve audit processes or public policies.

[Taka] The Comptroller General established the Innovation Lab in 2019 to spearhead hands-on exploration of emerging capabilities such as AI, blockchain, extended reality, and cloud services. The Lab's unique role is aimed for us to better articulate accountability implications, build oversight capacity, and to adopt our own use cases. We built a next-generation compute platform—dubbed the Analytics Foundry—for use by our growing teams of data scientists, statisticians, modelers, and technologists in support of the full innovation lifecycle from ideation, iteration, incubation, and through implementation. Here are select examples of our work:

- Establishing the first non-crypto prototype of a distributed ledger (a.k.a blockchain) that spans across multiple agency/entity operating boundaries to support grants management use case.
- Designed, trained, and tuned our own natural language processing models to enhance clarity of report writing, including automated detection of compliance with evolving writing guidance/standards.
- Developing a corpus of precedence papers to support appropriate use of specific machine learning techniques within oversight contexts and in compliance with audit standards.
- Deployed a first-of-its-kind interactive simulation tool that illustrates complex tradeoff decisions on use of digital identity verifications to potentially reduce improper payments.
- Exploring use of extended reality as a risk reduction tool for onsite work in high-risk operating environments.
- Implementing data literacy and data governance efforts specifically aligned to the audit tradecraft and standards.

Taka is the first Chief Data Scientist appointed by the Comptroller General of the United States for the Government Accountability Office. He also leads GAO's Innovation Lab in driving problem-centric experiments across oversight, insight, and foresight work through data science and emerging technologies. As a member of the federal Senior Executive Service, Taka is responsible for working with GAO stakeholders to adopt prospective views on impacts of emerging capabilities such as AI, cloud computing, blockchains, RPA, extended reality, and IoT.

Taka is a seasoned data science executive with over 22 years of experience helping private and public sector organizations make sense of hidden correlations, behaviors, relationships, patterns, and anomalies. He is passionate about fostering a data-informed culture, using data science as a catalyst to address complex regulatory, risk, operational, and business intelligence challenges.