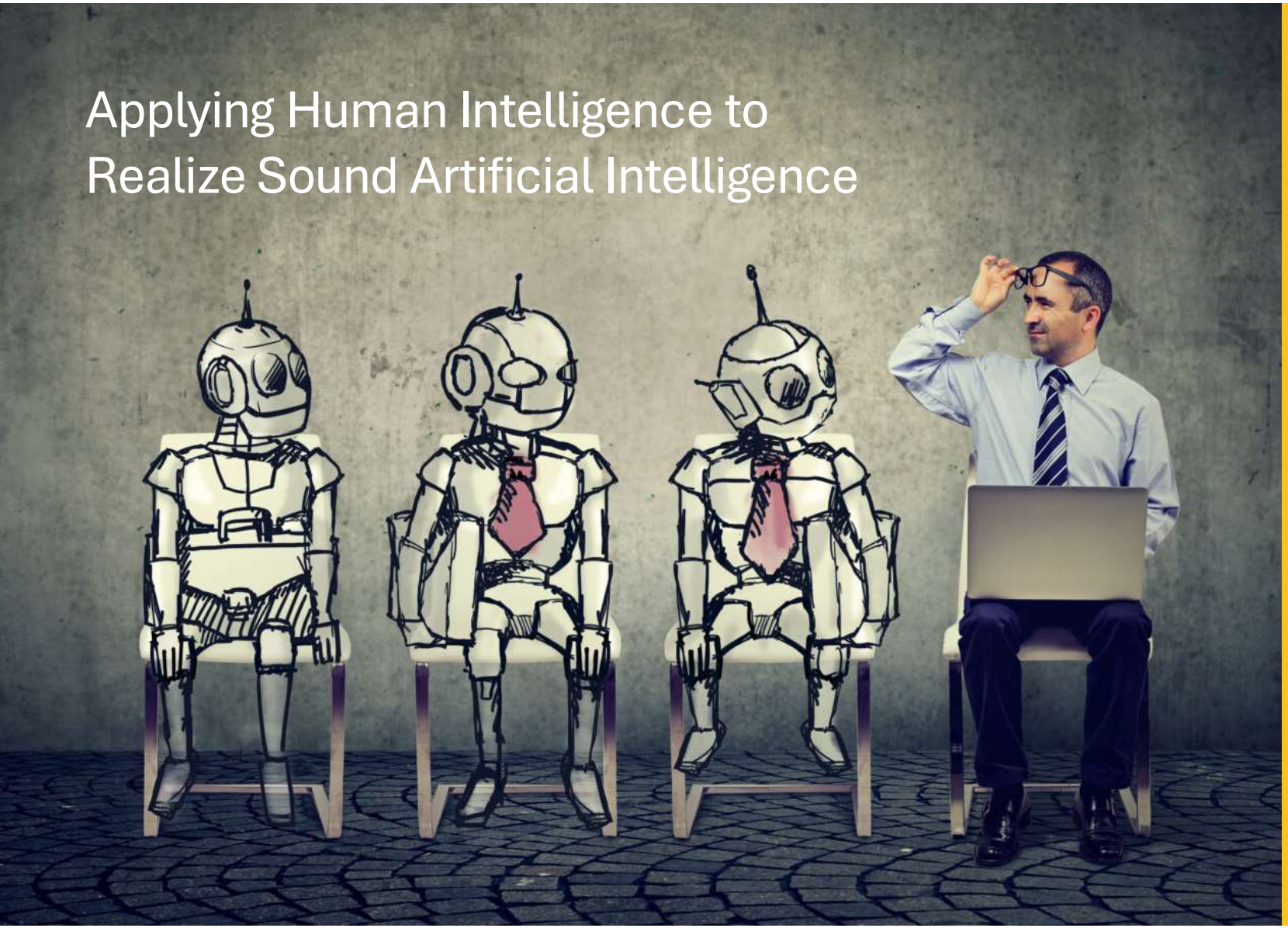
Applying Human Intelligence to Realize Sound Artificial Intelligence



TAKA ARIGA
Chief Data Scientist
Director of Innovation Lab
Government Accountability Office

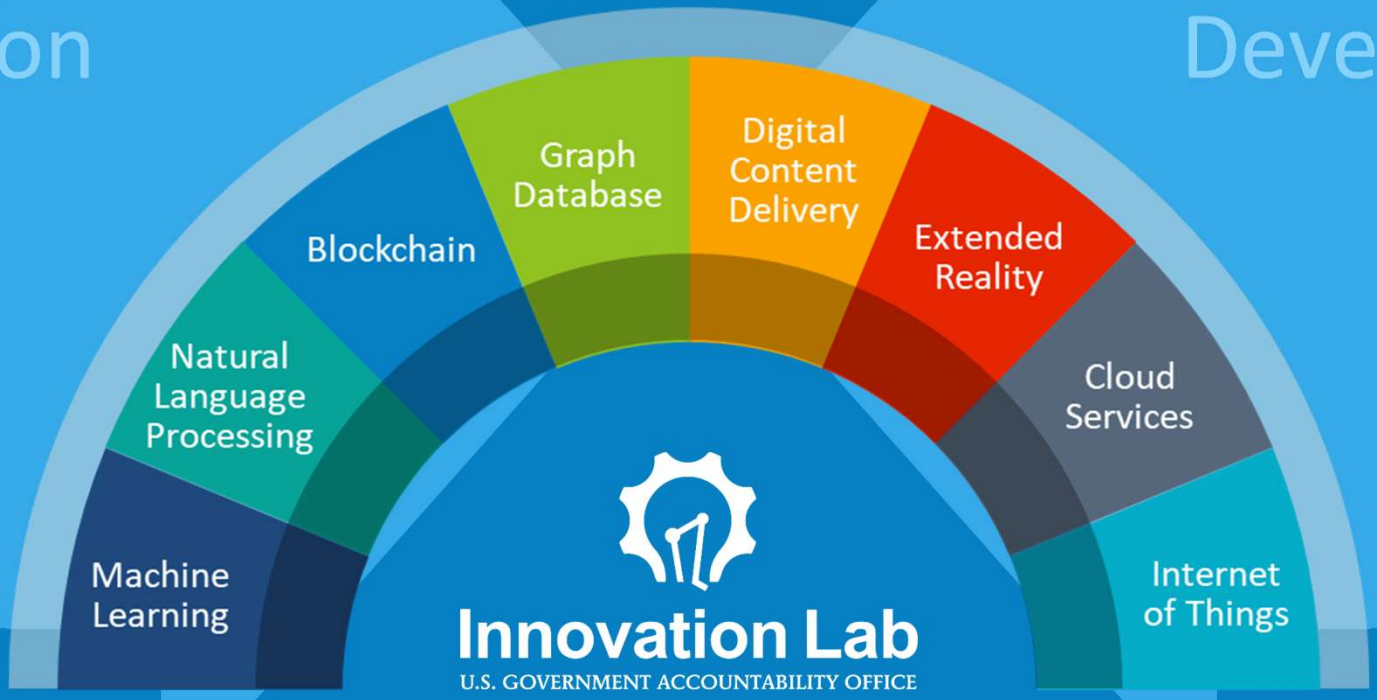
GAO

Oversight
Evaluation

Practitioners' Perspectives

Use case
Development

Enhanced Accountability



GAO

We are living in a golden era of algorithmic renaissance

SKILLED DIGITAL WORKFORCE

POLICIES & REGULATIONS

DATA QUALITY

IT INFRASTUCTURE & CYBERSECURITY

ACQUISITION PRACTICES

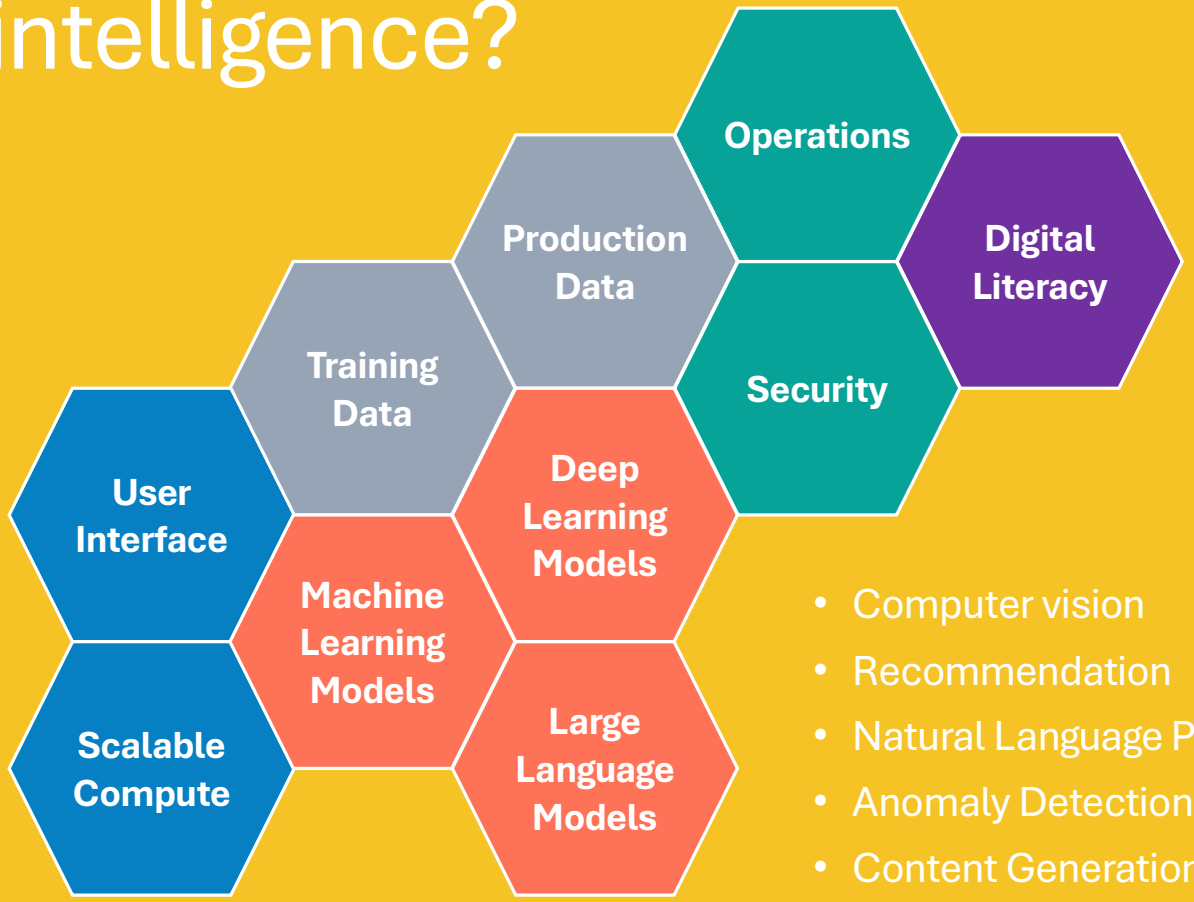
OVERSIGHT & MONITORING

What is the difference between AI and ML?

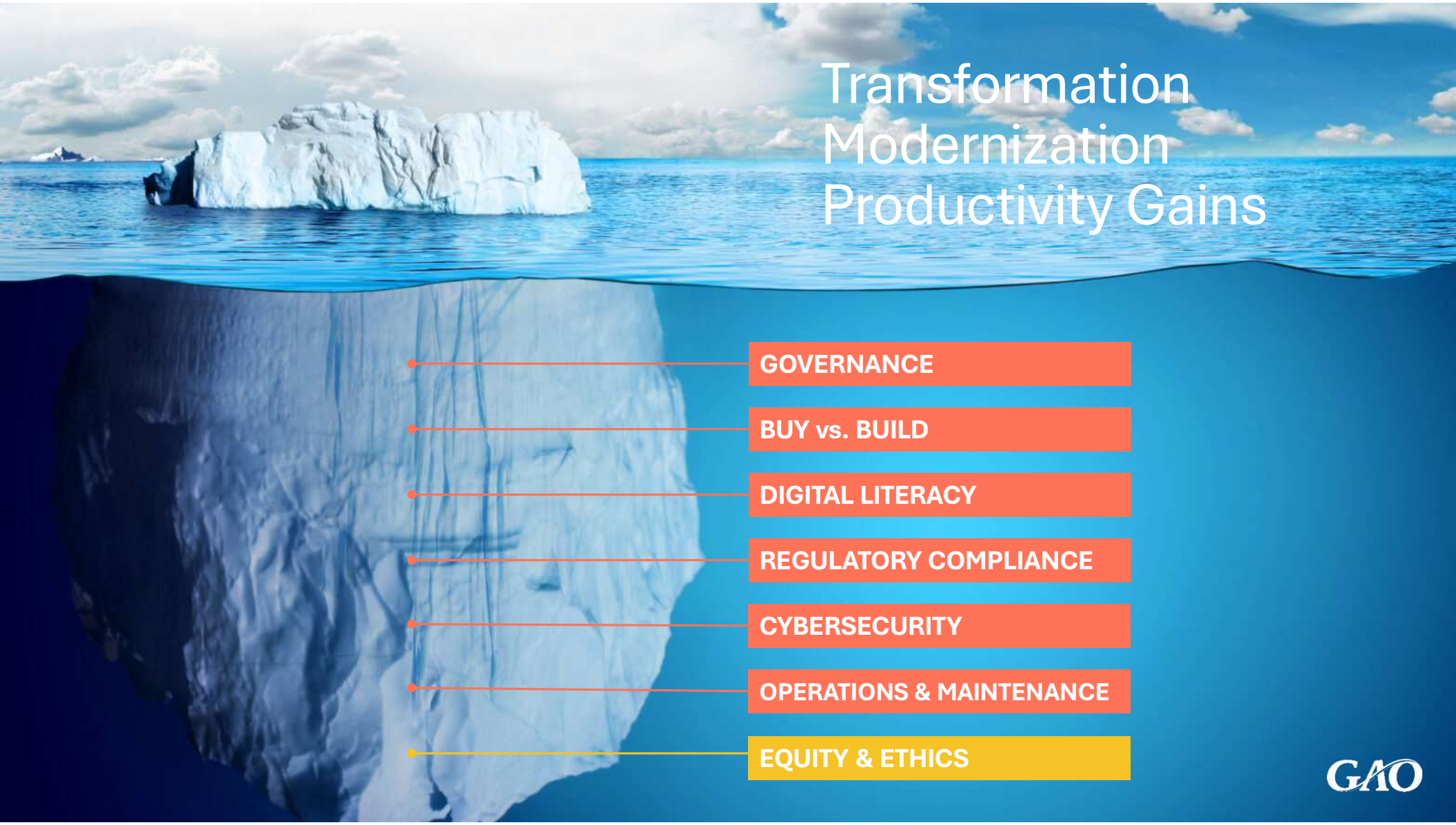
Artificial Intelligence

Machine Learning

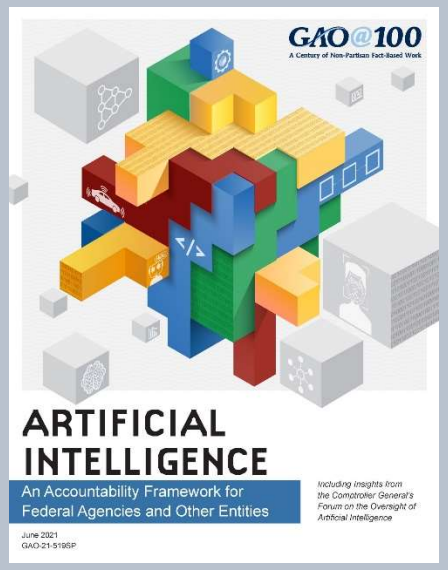
What constitutes artificial intelligence?



- Computer vision
- Recommendation
- Natural Language Processing
- Anomaly Detection
- Content Generation


Transformation
Modernization
Productivity Gains
GOVERNANCE
BUY vs. BUILD
DIGITAL LITERACY
REGULATORY COMPLIANCE
CYBERSECURITY
OPERATIONS & MAINTENANCE
EQUITY & ETHICS
GAO

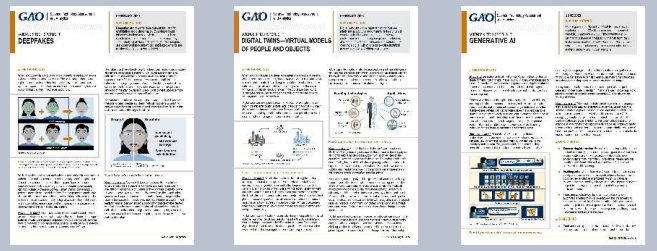
Trust but verify as an effective lever



Available at www.gao.gov

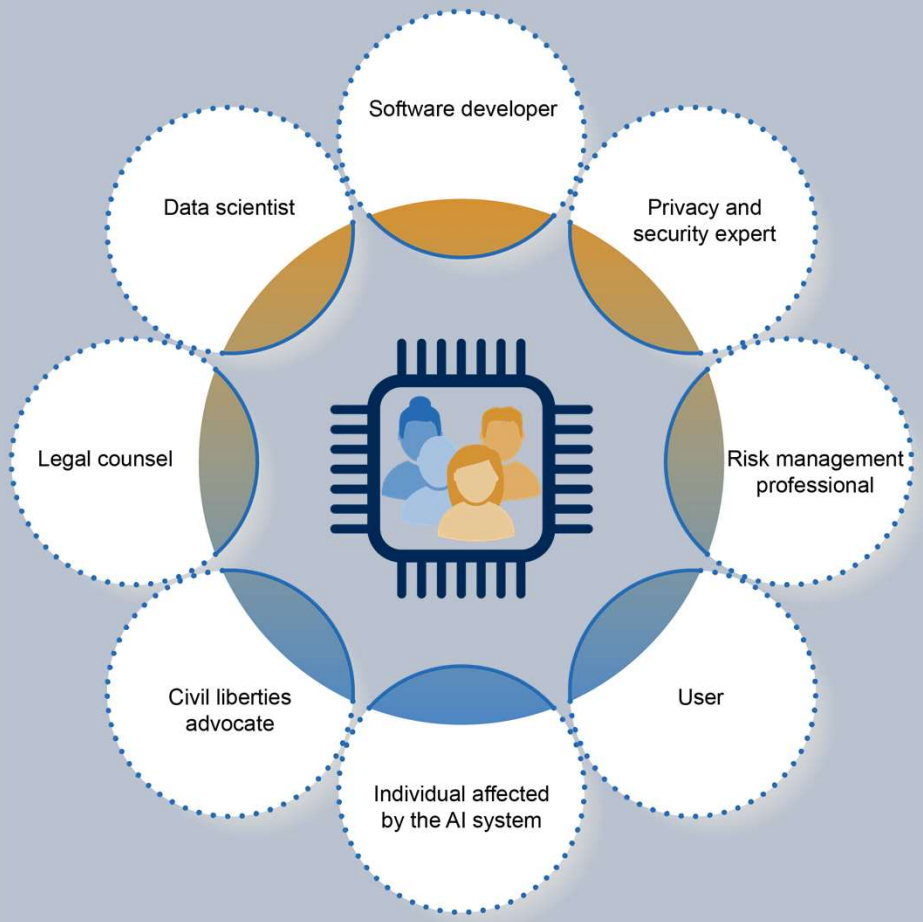
FORESIGHT

OVERSIGHT



INSIGHT

Managing AI as a team sport



Managing AI across life cycle

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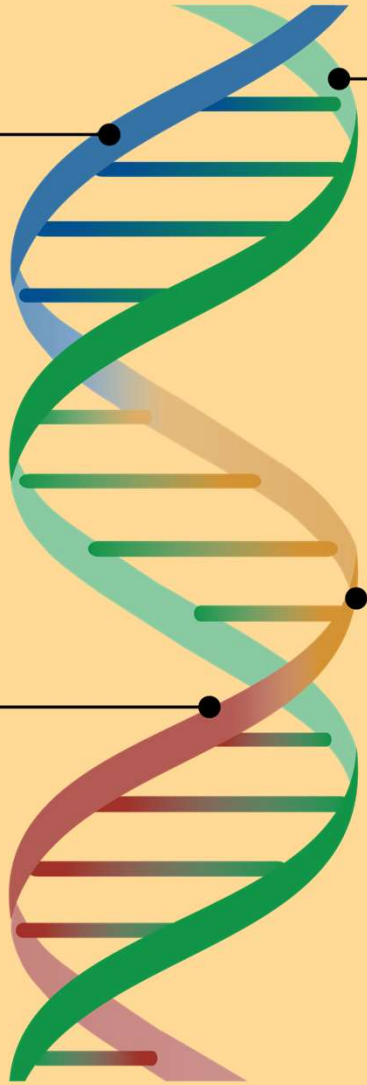

Data

Ensure quality, reliability, and representativeness of data sources and processing.

Data Used to Develop an AI Model

Entities should document sources and origins of data, ensure the reliability of data, and assess data attributes, variables, and augmentation/enhancement for appropriateness.

Data Used to Operate an AI System

Entities should assess the interconnectivities and dependencies of data streams that operationalize an AI system, identify potential biases, and assess data security and privacy.

Monitoring

Ensure reliability and relevance over time.

Continuous Monitoring of Performance

Entities should develop plans for continuous or routine monitoring of the AI system and document results and corrective actions taken to ensure the system produces desired results.

Assessing Sustainment and Expanded Use

Entities should assess the utility of the AI system to ensure its relevance and identify conditions under which the AI system may or may not be scaled or expanded beyond its current use.

Governance

Promote accountability by establishing processes to manage, operate, and oversee implementation.

Governance at the Organizational Level

Entities should define clear goals, roles, and responsibilities, demonstrate values and principles to foster trust, develop a competent workforce, engage stakeholders with diverse perspectives to mitigate risks, and implement an AI-specific risk management plan.

Governance at the System Level

Entities should establish technical specifications to ensure the AI system meets its intended purpose and complies with relevant laws, regulations, standards, and guidance. Entities should promote transparency by enabling external stakeholders to access information on the AI system.

Performance

Produce results that are consistent with program objectives.

Performance at the Component Level

Entities should catalog model and non-model components that make up the AI system, define metrics, and assess performance and outputs of each component.

Performance at the System Level

Entities should define metrics and assess performance of the AI system. In addition, entities should document methods for assessment, performance metrics, and outcomes; identify potential biases; and define and develop procedures for human supervision of the AI system.

Asking some human intelligence questions

1. Is there a simpler (non-AI) solution to the problem?
2. How do you decide *could* vs. *should*?
3. Do you own AI or does AI own you?

AI USE CASE	POTENTIAL BENEFITS	MATURITY PHASE	RELEVANT TECHNIQUES
Organizes large volumes of text, such as public comments from Regulations.gov	• Groups contents by similar themes. • Prioritizes reviews based on relevant hierarchical topics.	Late-stage prototype	• Natural language processing • Topic modeling • Sentiment analysis • Semantic matching
Summarizes draft GAO legislative mandates	• Increases efficiency and reduces manual processes. • Highlights potentially fragmented and duplicative mandates.	Late-stage prototype	• Natural language processing • Large language model • Semantic matching • Regular expressions
Assists with copyediting according to GAO's style guide	• Automates select copyediting tasks. • Enables staff to focus on narrative structure and clarity.	Late-stage prototype	• Natural language processing • Neural network modeling • Sentiment analysis
Provides automated responses to chat questions on published GAO work	• Summarizes published GAO contents. • Enhances specificity and accuracy of results.	Early-stage prototype	• Large language model configuration • Prompt engineering • Retrieval Augmented Generation • User telemetry measurement
Summarizes qualitative responses from annual GAO Employee Experience Survey	• Identifies trends, patterns, and sentiments quickly. • Improves survey interpretation with less manual intervention. • Assists with root-cause analyses.	Early-stage prototype	• Natural language processing • Large language model
Monitors information about congressional committee calendars, press releases, and web contents	• Matches congressional interests with relevant GAO work. • Enhances timeliness of outreach and technical assistance.	Early-stage prototype	• Natural language processing • Large language model • Semantic matching
Enhances GAO auditing through use of extended reality glasses	• Improves collaboration across locations. • Reduces costs and risks. • Enables new data capturing and analysis opportunities.	Concept exploration	• Computer vision and object recognition • Real-time image, video, and sensor data processing
Triages IT help desk requests and answers internal GAO policy questions	• Provides 24/7 self-service assistance to GAO employees. • Allows support staff to focus on more complex requests.	Concept exploration	• Natural language processing • Large language model • Sentiment analysis • Integrated workflow and escalation

AI is here to stay but traversing a winding road ahead