

AI, the Great and Powerful

Coupling Cautious Enthusiasm with Purpose in NNSA PA&E's AI Strategy

Peace Through Atomic Strength



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Author Introduction

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Maura supports the NNSA Office of Programming, Analysis, and Evaluation. She has experience identifying and building innovative solutions to improve internal business processes and to support PA&E's analytical work. She holds a BS in Neuroscience, an MAIS in Computational Social Science, and an Executive MBA. She is a former NGFP Fellow and Boren Scholar (Arabic) and is VP of the National Security Education Program (NSEP) Alumni Association.

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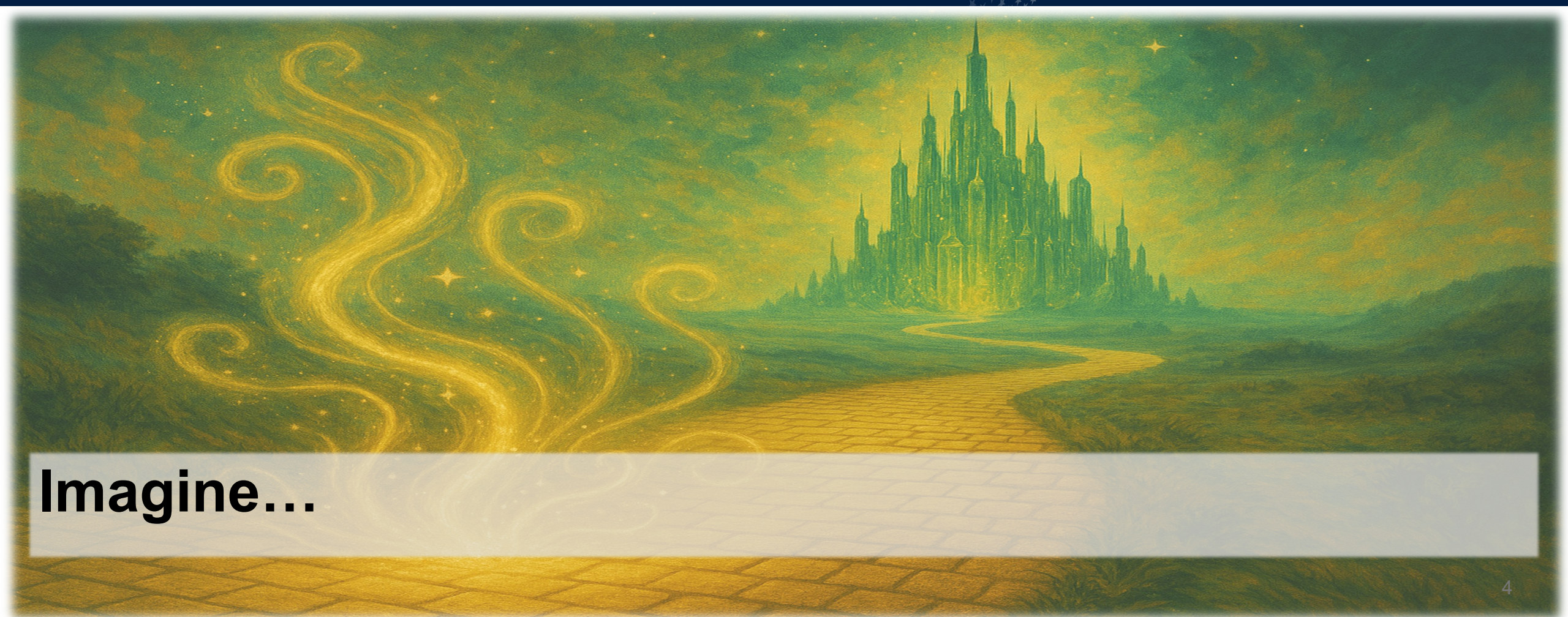
Abstract / Overview

Today's trope is that AI is either entirely useless or will solve all our problems. So, how can the cost community ensure that AI is truly great and powerful and not just a "confidence man" behind the curtain? The NNSA Office of Programming, Analysis, and Evaluation (PA&E) is answering this very question by developing an in-house AI Strategy and Implementation Plan, improving the efficacy of applied AI without risking mission.

This strategy thoughtfully and intentionally approaches AI for programmatic cost estimation and PPBE, built upon the sturdy foundation of an AI-literate workforce with AI-ready data. We will describe the strategy development process, how it supports NNSA's cost estimating goals, current progress toward strategic objectives, PA&E's development of an AI Platform Evaluation, implementation challenges, and lessons learned. Further, we will warn what happens when you stray from the yellow brick road leveraging AI tools without a coherent AI strategy.

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Welcome to the Land of OzGPT



Imagine...

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Welcome to the Land of OzGPT

Please send me home.

The Wizard responds:

Where is home?

Kansas, you say.

The Wizard considers for some time and eventually says:

There is no Kansas in Oz.

Confused, you reply:

I know there is no Kansas in Oz, I'm trying to get back to Kansas.

Welcome to the Land of OzGPT

The Wizard says again:

According to my sources, Kansas does not exist.

You say:

It does exist and I'm trying to get back there. Please help me get home.

The Wizard pauses, thinking, and finally, finally, you think, the Wizard will solve my problem.

Suddenly, the Wizard responds, this time with an air of finality:

You've reached the request limit. Try again in one month.

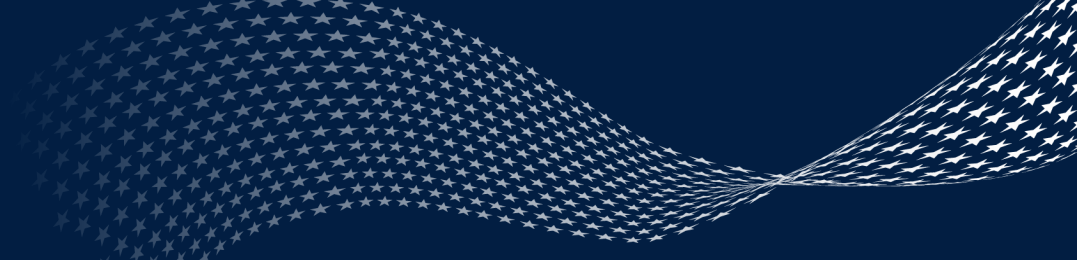
Agenda

- Introduction
- Pay No Self-Attention to the Man Behind the Curtain
 - Coupling Caution and Enthusiasm
- That Storm Didn't Come Out of Nowhere, You Know
 - Lessons Learned from Historical Technological Shifts
- A Lay of the Land
 - Federal AI Policy and the NNSA
- Building the Road to Oz
 - Strategic Planning for AI Adoption Success
 - KPI Scoreboard
- Challenges, Lessons Learned, and Next Steps

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BLUF

- AI is not the first tech revolution
- We can apply the lessons learned from previous tech revolutions to the AI revolution for a smooth, successful rollout
- PA&E developed an AI strategy and implementation plan built around these lessons learned

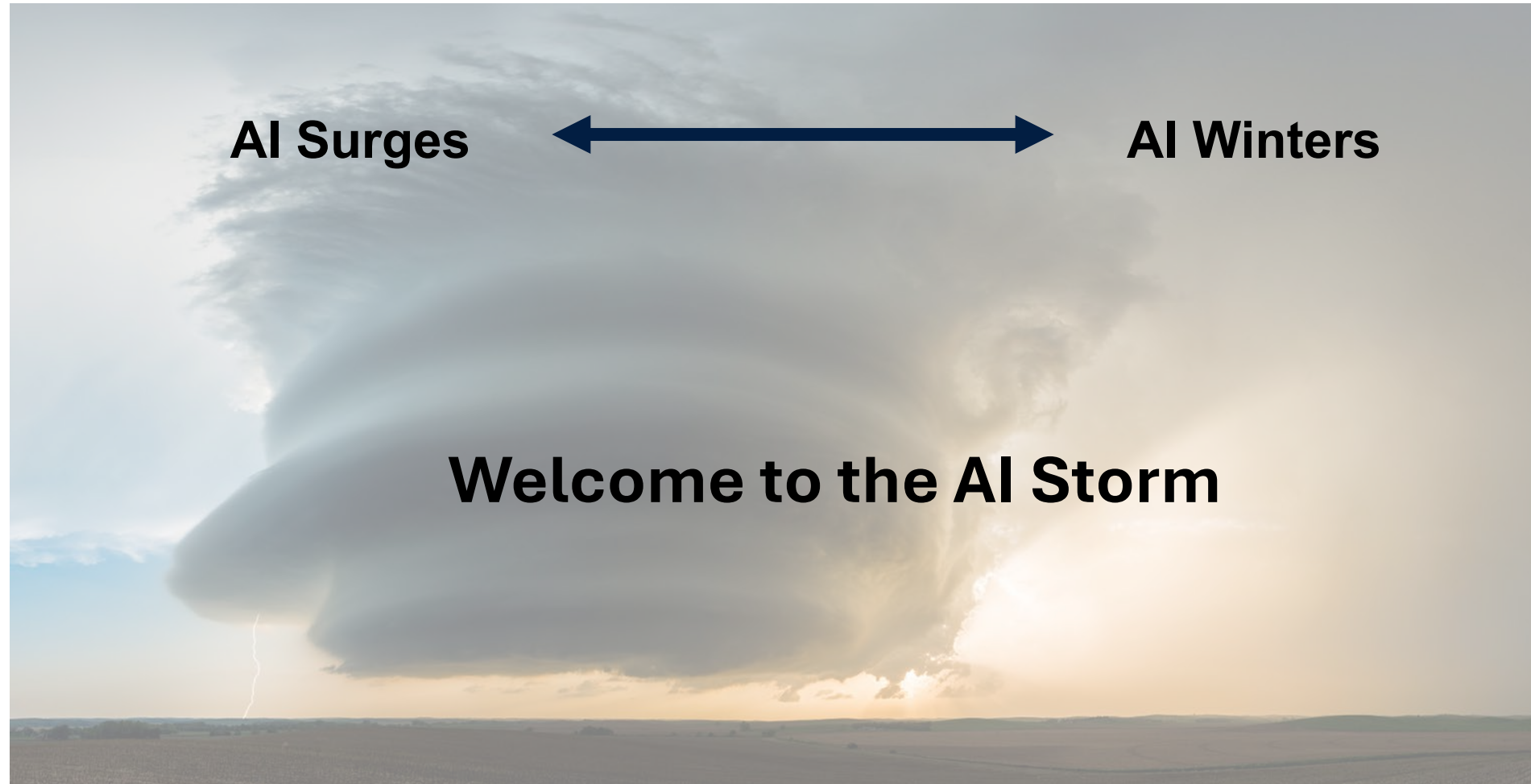


Pay No Self-Attention to the Man Behind the Curtain

Coupling Caution and Enthusiasm

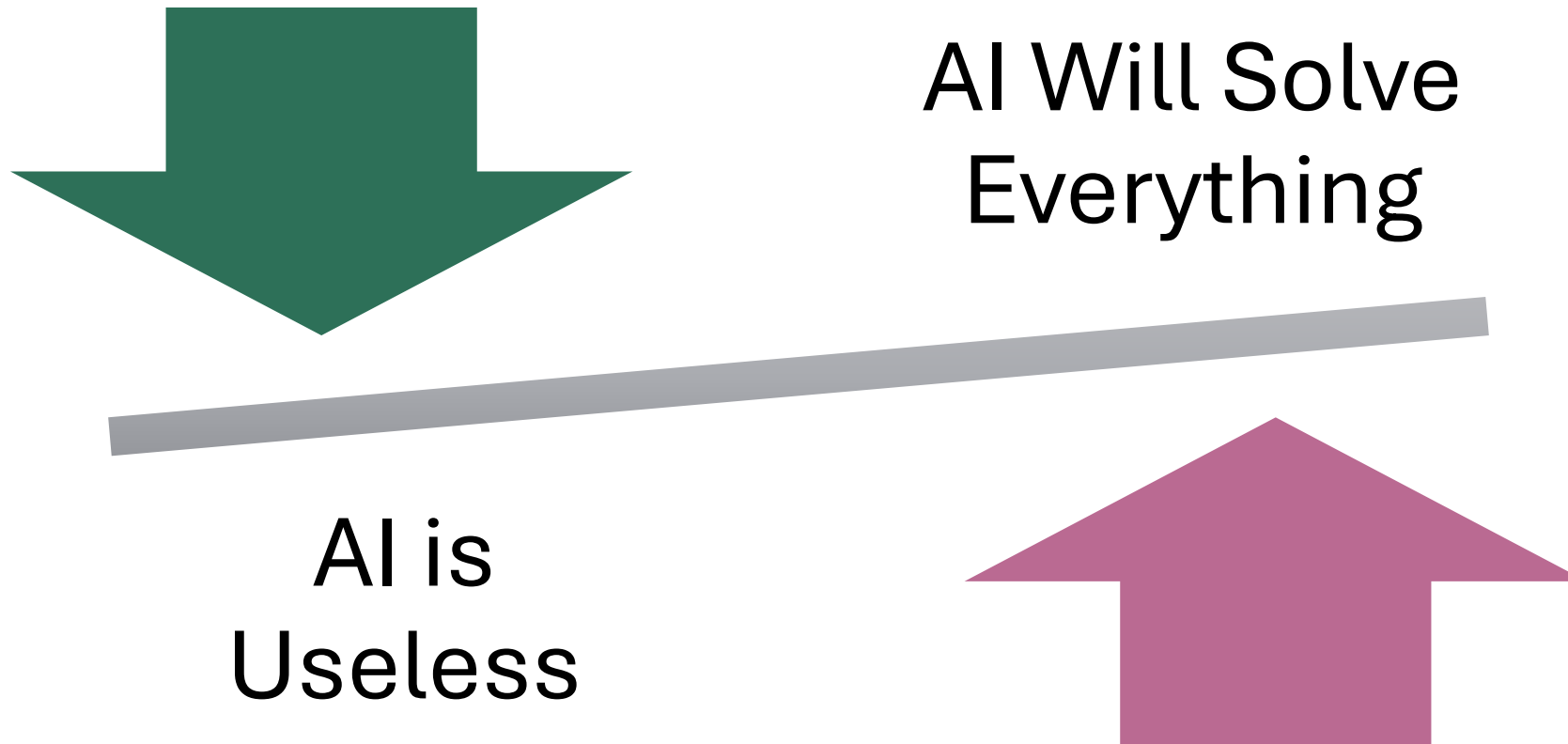
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Pay No Self-Attention to the Man Behind the Curtain



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Pay No Self-Attention to the Man Behind the Curtain



NNSA Office of Programming, Analysis, and Evaluation (PA&E)

- Coordinates and collaborates with Program Offices to support development of data-informed program plans and provide defensible analytical products for the Planning, Programming, Budget and Evaluation (PPBE) process.
- Functions include leading decision support analyses, and cost estimating for
 1. capital acquisitions,
 2. strategic planning, and
 3. major weapons modernization programs.
- Teams dedicated to analyses of alternatives, infrastructure, weapons, and developing modeling, tools, and policy in support of NNSA's PPBE and acquisition process.
- Acts as a focal point for education, collaboration, and innovation

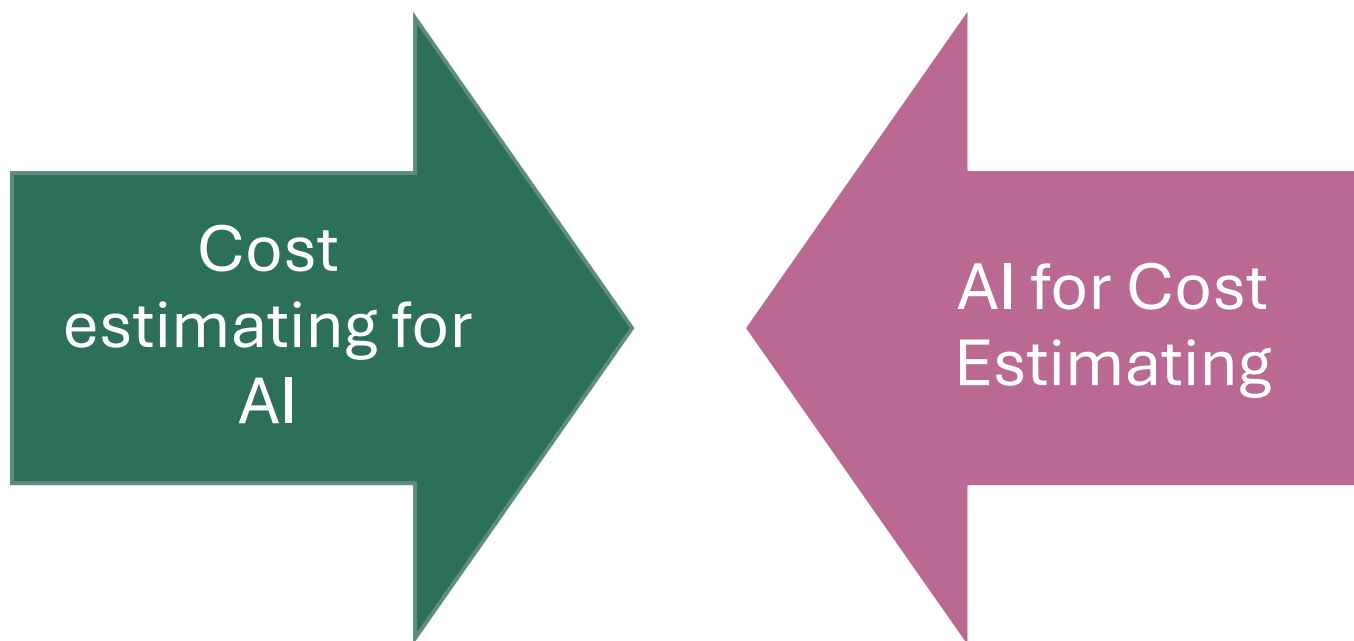
Why Does PA&E Need an AI Strategy?

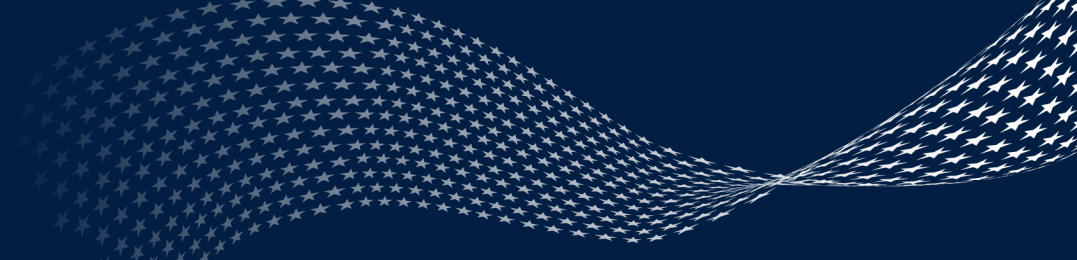
The nuclear security enterprise is large and includes multiple critical national security missions, which creates challenges for AI adoption:

1. A risk averse culture
2. Data siloing
3. High-impact, but constantly evolving priorities

Why Does PA&E Need an AI Strategy?

★ PA&E wears two hats:





That Storm Didn't Come Out of Nowhere, You Know

Lessons Learned from Historical Technological Shifts

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Technological Transformation & Institutional Response



Industrial Revolution

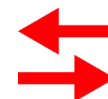


Institutional Lag

- Tech outpaced safeguards.
- Rapid changes to work, markets, city life.
- Systems lagged: labor laws, regulation, sanitation.



Electrification



Early Fragmentation

- Unintentional fragmentation, uncoordinated development.
- Resulted in early inefficiencies; success required later coordination.

Technological Transformation & Institutional Response



The Manhattan Project

A Model of Intentional Fragmentation

- Centralized yet decentralized to manage risk.
- Intentional fragmentation under central coordination proved effective for technological uncertainty.



Cloud Computing

A Model of Unintentional Fragmentation

- Aimed to resolve fragmentation, offering shared platforms with governance.
- Creates illusion of easy reversals.
- Hidden strategic dependencies, costs, and governance accumulate unseen.

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When Innovation Outruns Institutions

*“Are people born wicked,
or do they have wickedness thrust upon them?”*

- Wicked (2024)

- New capabilities emerge faster than governance, norms, and organizational structures can adapt
- Early phases are marked by **misalignment, inefficiency, and unintended consequences**
- Stabilization only occurs after institutions evolve to match the technology

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A Lay of the Land

Federal AI Policy and the NNSA

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We Are Not in Kansas Anymore

PRESIDENTIAL ACTIONS

REMOVING BARRIERS TO AMERICAN LEADERSHIP IN ARTIFICIAL INTELLIGENCE

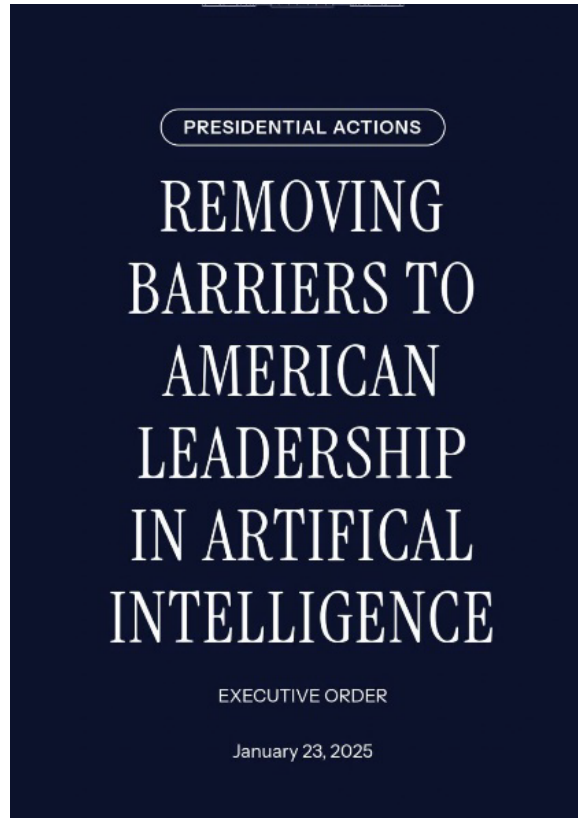
EXECUTIVE ORDER

January 23, 2025

“It is the policy of the United States to sustain and enhance America's **global AI dominance** in order to promote human flourishing, economic competitiveness, and national security.”

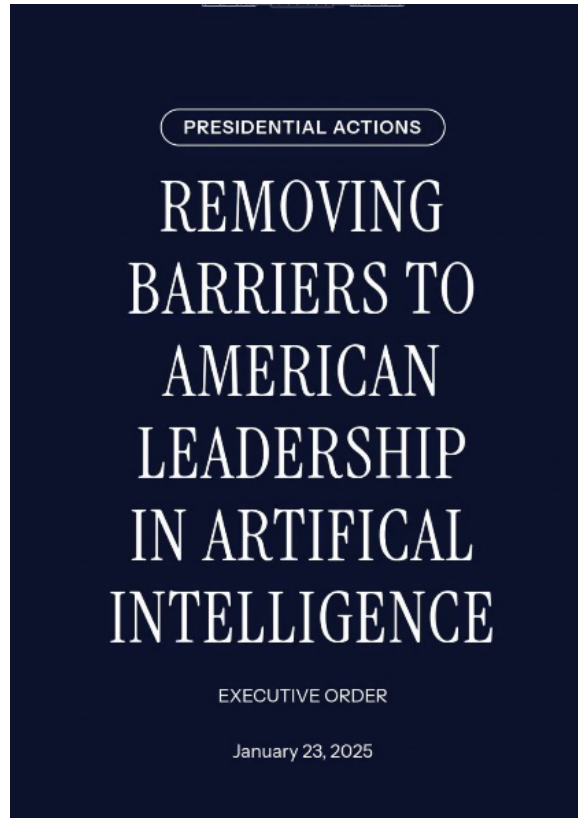
(The White House 2025)

We Are Not in Kansas Anymore



- I. Accelerate AI Innovation
- II. Build American AI Infrastructure
- III. Lead in International AI Diplomacy and Security

We Are Not in Kansas Anymore



**US federal agencies MUST facilitate innovation
and remove roadblocks to implementation wherever possible**

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We Are Not in Kansas Anymore

- What is Genesis Mission?
 - A national initiative led by the Department of Energy and its 17 National Laboratories to build the world's most powerful scientific platform to accelerate discovery, strengthen national security, and drive energy innovation. - [Genesis Mission](#)
- Goal
 - Genesis Mission will develop an integrated platform that connects the world's best supercomputers, experimental facilities, AI systems, and unique datasets across every major scientific domain to **double the productivity and impact of American research and innovation within a decade.**

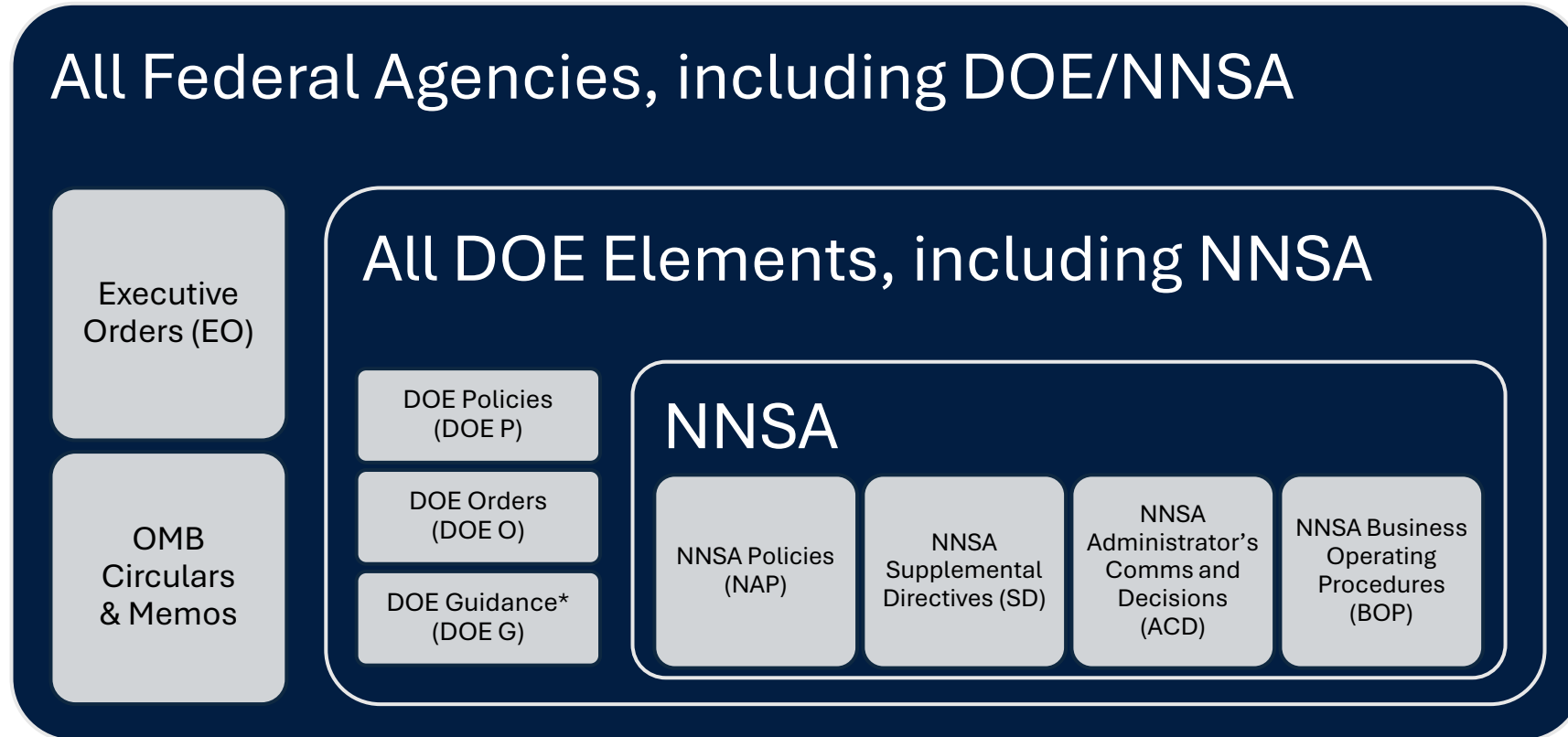
We Are Not in Kansas Anymore

- DOE Policy 203.1: “Use of Generative Artificial Intelligence”
 - Expected behavior of DOE Federal Employees and Contractors
 - Reporting requirements
 - Legal implications
 - Handling of IP and sensitive data

Collectively, these visions, goals, and strategies provide directions and guardrails for NNSA, but space for implementation is vast and requires further refinement

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We Are Not in Kansas Anymore

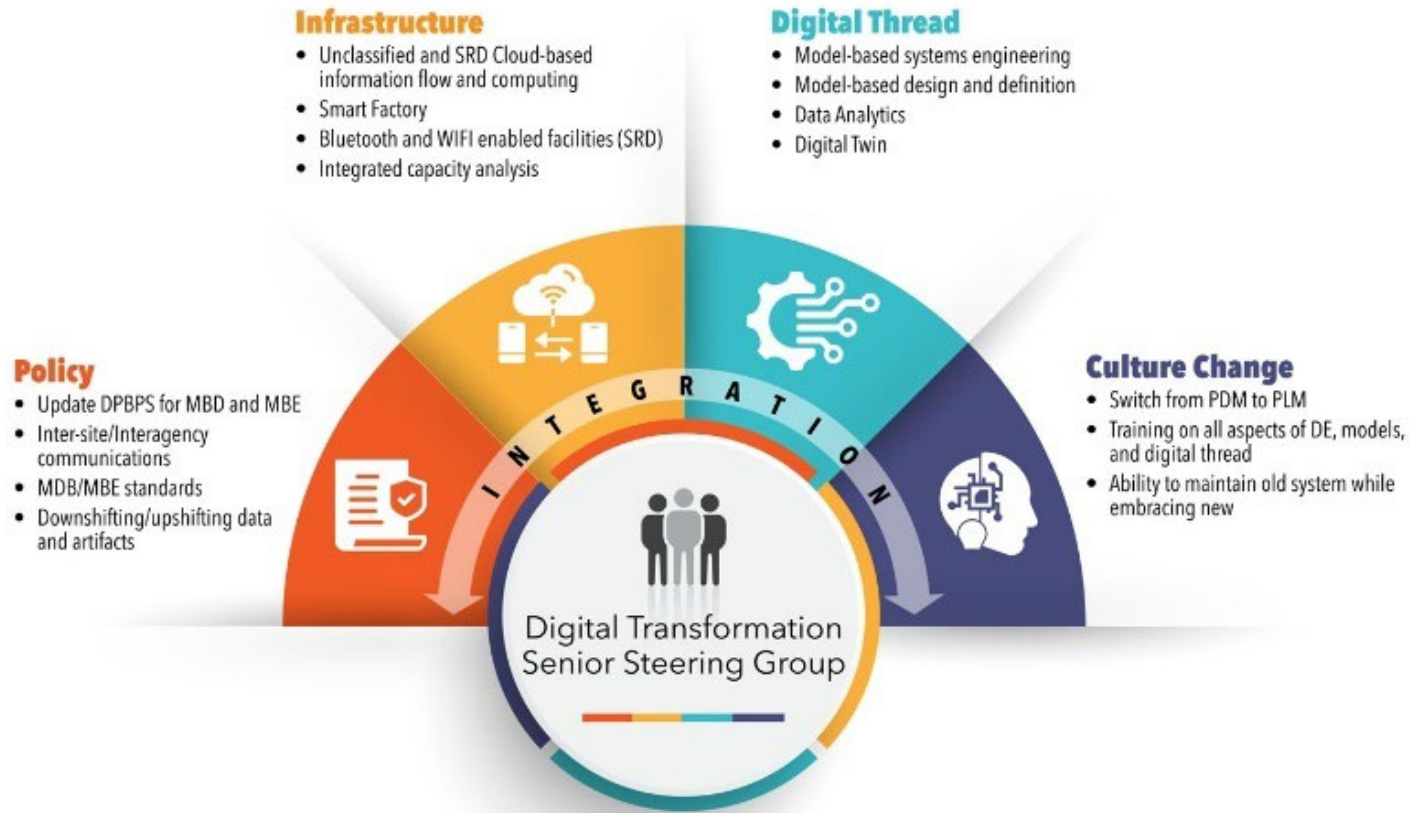


*Note: DOE guidance is non-binding; additional caveats to contractors apply 25

NNSA AI Strategy (April 2026)

Strategic Imperatives	Strategic Imperatives		
	AI for Nuclear Security	AI for American Innovation Dominance	Enterprise AI Infrastructure
Foundational Pillars	AI-Ready Workforce	AI and Data Governance	AI for Mission Enablement

Did DT Walk So AI Could Fly?

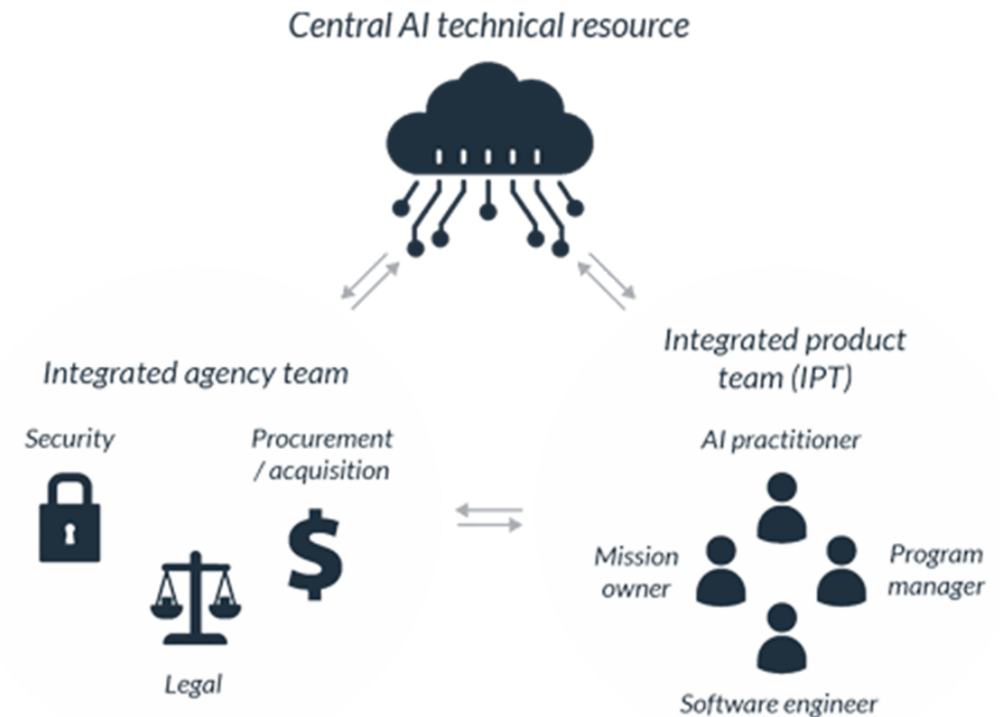


DIGITAL ENGINEERING TRANSFORMATION

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GSA AI Community of Excellence

- ★ “Embed AI professionals in the mission centers and program offices, but they should have access to a **one-stop-shop** for AI tools and resources in a central AI resource”
- ★ “The **central AI technical resource** provides **technical and infrastructure support** as well as access to legal, security, and acquisition support for AI professionals in the mission center and program office to succeed in AI adoption efforts.”



(General Services Administration Artificial Intelligence Center of Excellence n.d.)

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Status Quo – Stay in Kansas

- ★ Data Governance –
 - Data siloes
 - SaaS Sprawl
- ★ Workforce
- ★ “Strategy” informed without experience
- ★ Waiting for top-down direction before moving forward

Building the Road to Oz

Strategic Planning for AI Adoption Success



Google Imagen 4 (2026)

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PA&E AI Strategy

Cautious Enthusiasm	Purposeful AI Implementation	Alignment
The strategy emphasizes a careful approach toward AI development, balancing enthusiasm with necessary caution.	AI initiatives must align with specific goals and objectives with measurable Key Performance Indicators (KPIs)	The NNSA PA&E's strategy must align to higher level policy and strategy

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AI-Readiness



AI-Ready Workforce

Building an AI-ready workforce is essential for leveraging AI technologies effectively within the organization.



AI-Ready Data

Ensuring that data is clean, structured, and accessible is critical for effective AI implementation and decision-making.



Access to AI Capabilities

Having access to the right AI technologies and tools is vital for PA&E to fully realize AI's potential.

If Only I Had the Nerve – Challenging the status quo requires courage

I could show my prowess

Be a lion, not a mouse

If I only had the nerve

-The Cowardly Lion (Fleming 1939)

- Failure to recognize obstacles forces organizations into a reactive posture, as occurred during the Industrial Revolution
- PA&E aims to lean into our nuclear technology heritage by bravely, but deliberately, acknowledging and embracing risks with careful planning and governance

If Only I Had a Brain

*Gosh, it would be awful pleasin'
To reason out the reason
For things I can't explain*

-The Scarecrow (Fleming 1939)

- Recognizing success requires self-awareness and clearly defined objectives
- PA&E's strategic objectives fail-safe, with an emphasis on data quality and workforce development that will pay dividends regardless of AI outcomes

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If Only I Had a Brain

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-The Scarecrow (Fleming 1939)

Five strategic priorities:

1. Data-conscious, AI-ready workforce development
2. High-quality, accessible data
3. NNSA enterprise PPBE ontology
4. Tools and model development
5. Unified Data Platform

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If Only I Had a Heart

*When a man's an empty kettle / He should be on his mettle
And yet I'm torn apart / Just because I'm presumin'
That I could be a human / If I only had a heart*

-The Scarecrow (Fleming 1939)

- The heart of PA&E's AI strategy is the Implementation Plan, which includes time-phased goals, objectives, and key performance indicators (KPIs) that map to the five strategic priorities

If Only I Had a Heart

*When a man's an empty kettle / He should be on his mettle
And yet I'm torn apart / Just because I'm presumin'
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Goals, Objectives, and KPIs, such as:

- Host and/or attend data management and AI training sessions
 - i.e., Hold > 2 Brown Bags / Year
- Conduct a study to map data governance landscape across the enterprise and report findings
- Develop and document metadata tags and a file hierarchy that conform to PA&E's PPBE ontology, then tag and organize files
- Issue guidance with respect to FAIR data management and information security, with individual compliance requirements

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Work Done to Date

- AI Bootcamp Sessions:
 - ✓ Introduction to AI
 - ✓ Copilot and Ask Sage
 - ✓ Prompt and Context Engineering
 - Pre/Post Test Score: 13% knowledge improvement (<25% goal)
- PA&E approved AI IDP
- Joined NNSA's Data Governance Board
- Joined NNSA's AI Workforce Working Group/AI-Ready Workforce Implementation Team
- Direct Planning Support to NA-1 Genesis Team
- Supporting NA-IM Pilot for AI Coding Assistant Pilot and Tool Deployment
 - Building Developer Onboarding Templates/Best Practices

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Challenges, Lessons Learned, and Next Steps

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Strategic Direction and Vertical Alignment

- The concurrent effort in Genesis Mission and NNSA's higher-level AI strategy development was both a constraint and an opportunity for PA&E's internal planning.
 - Scope / Messaging Changes: Genesis S&T Challenges → Mission S&T Challenges (MSTCs) → National S&T Challenges (NSTCs)
 - NNSA's role in Genesis Mission
 - Changing Number and Scope of Challenges
 - Currently R&D focused and not prioritizing Business Systems and Efficiency Gains
 - e.g., PA&E Supported development of Business Systems MSTC that has since been dropped
 - Genesis scope broadened → MOUs with DoW, NIST, NASA

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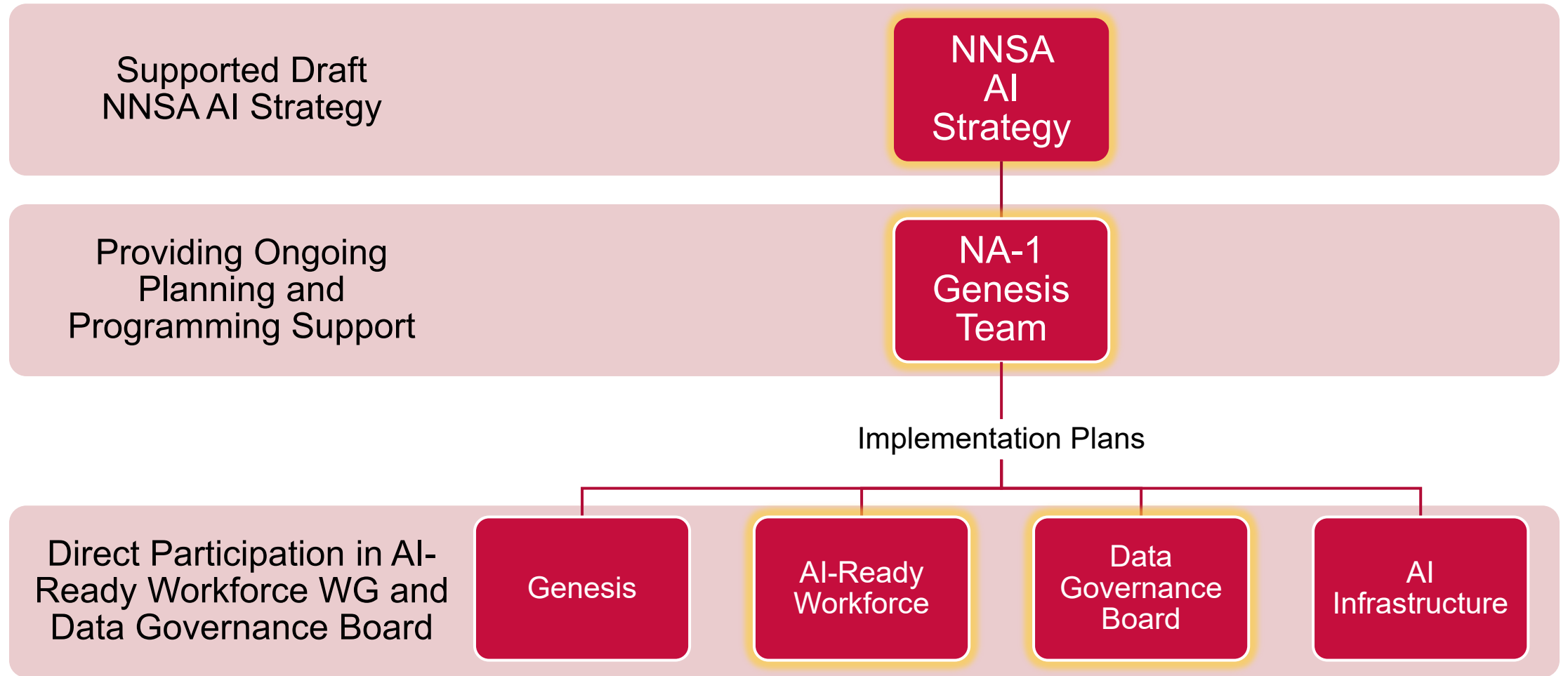
Horizontal Alignment

PA&E identified new partnerships with other NNSA organizations on common efforts and interests:

- AI-Ready Workforce Implementation Team
 - PA&E supported development of AI-Ready Workforce Implementation Plan
 - ✓ Dr. Ball signed plan
- NNSA Data Governance Board
 - PA&E Member represents MB Designee on Board
 - ✓ Data Governance Board Charter Signed by Board Chair
- PPBE
 - PA&E ensuring alignment with wider PPBE-specific data governance efforts

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PA&E Contributions to Date



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Cautious Optimism

- PA&E considers itself ahead in the strategy implementation process
- Some traction on KPIs, but trying to ensure alignment with wider efforts, capabilities, and timelines
 - PA&E Data Governance KPIs should align with wider PPBE Data Governance efforts
 - Tool availability constantly changing, trying to be proactive not reactive

Summary and Next Steps

“Without strategy, execution is aimless.
Without execution, strategy is useless.”

– Morris Chan, TSMC

- **Continue to support NNSA on its AI Implementation**
- **Implementation Plan Phase Two (FY28+)**
 - Focus on utilization and alignment

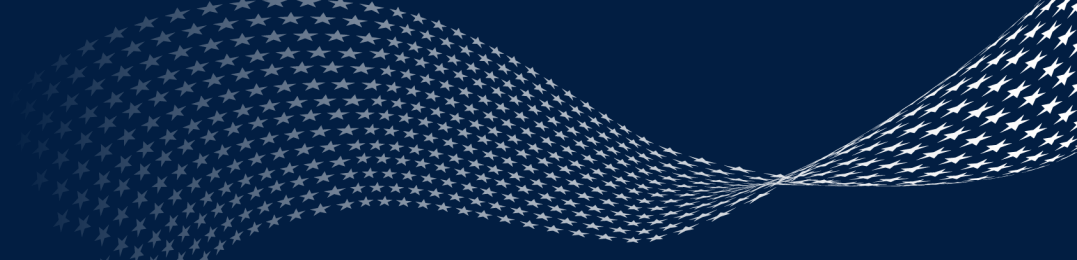
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Questions?



Thank You!

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