



Generative AI in Public Health: CDPH's Journey Toward Responsible GenAI Innovation

Presenter

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 - Security Operations
 - Cognitive Services
 - Solutions Architecture
 - Identity and Access Management
- **Former USMC, Data Comm (95-99)**
- **10 Years on the National Ski Patrol**

Introduction to CDPH

Mission of CDPH

- To advance the health and well-being of California's diverse people and communities.

Vision of CDPH

- Healthy communities with thriving families and individuals. Improving Health Outcomes

Mission of CDPH IT

- Leverage technology to improve health outcomes and streamline operational efficiency.



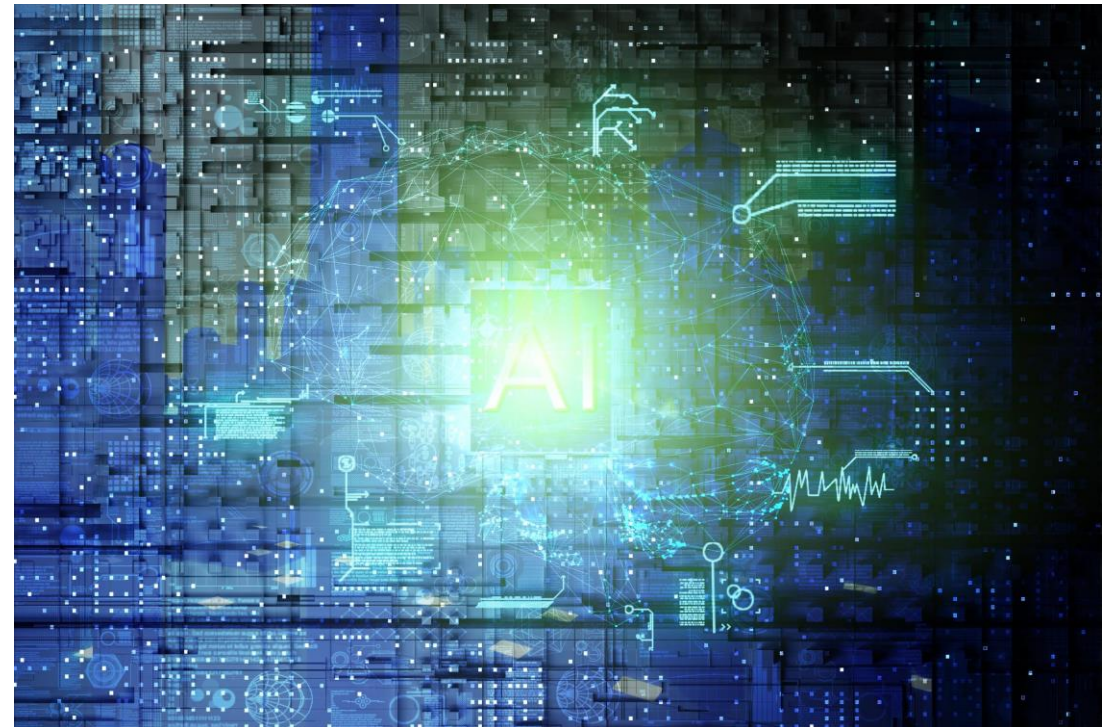
Agenda Items

- **GenAI Readiness at CDPH**
- **CDPH Adoption of Generative AI Tools**
- **CHCQ GenAI Initiative**
- **Governance Considerations**
- **Privacy and Security**
- **Equity and Ethical Considerations**
- **The Future of AI?**

AI: Old vs. New

Traditional AI such as Machine Learning, Computer Vision or Robotic Process Automation focused on recognizing patterns and making “decisions” based on existing data like detecting fraud, recommending products, or classifying images or conducting pre-programmed automations.

Generative AI (GenAI) can create new content such as text, images, audio, or code based on patterns it has learned from existing data. It uses models like large language models (LLMs) or generative adversarial networks (GANs) to generate outputs that resemble human-created content.





Generative AI @ CDPH

Organizational Readiness

Built for AI

Data Governance & Infrastructure

Ensure access to high-quality, well-governed data that is secure, labeled, and compliant with privacy regulations.

Talent & Skills Readiness

Build internal capacity with GenAI-literate staff, including data scientists, AI/ML engineers, and domain experts.

Ethical & Responsible AI Frameworks

Develop clear policies for bias mitigation, transparency, and accountability in GenAI use.

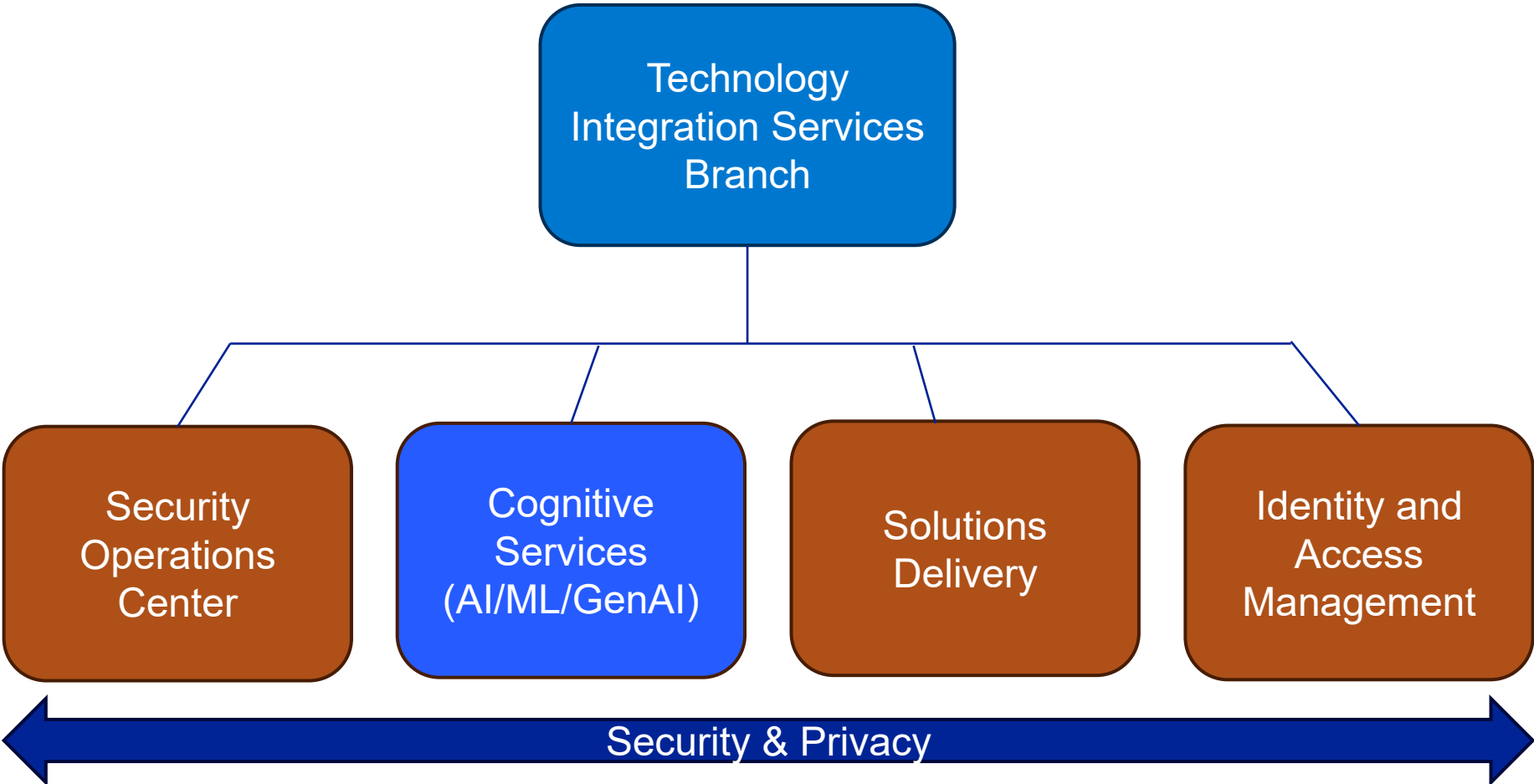
Change Management & Culture

Foster a culture of experimentation and innovation, while managing expectations about GenAI's capabilities.

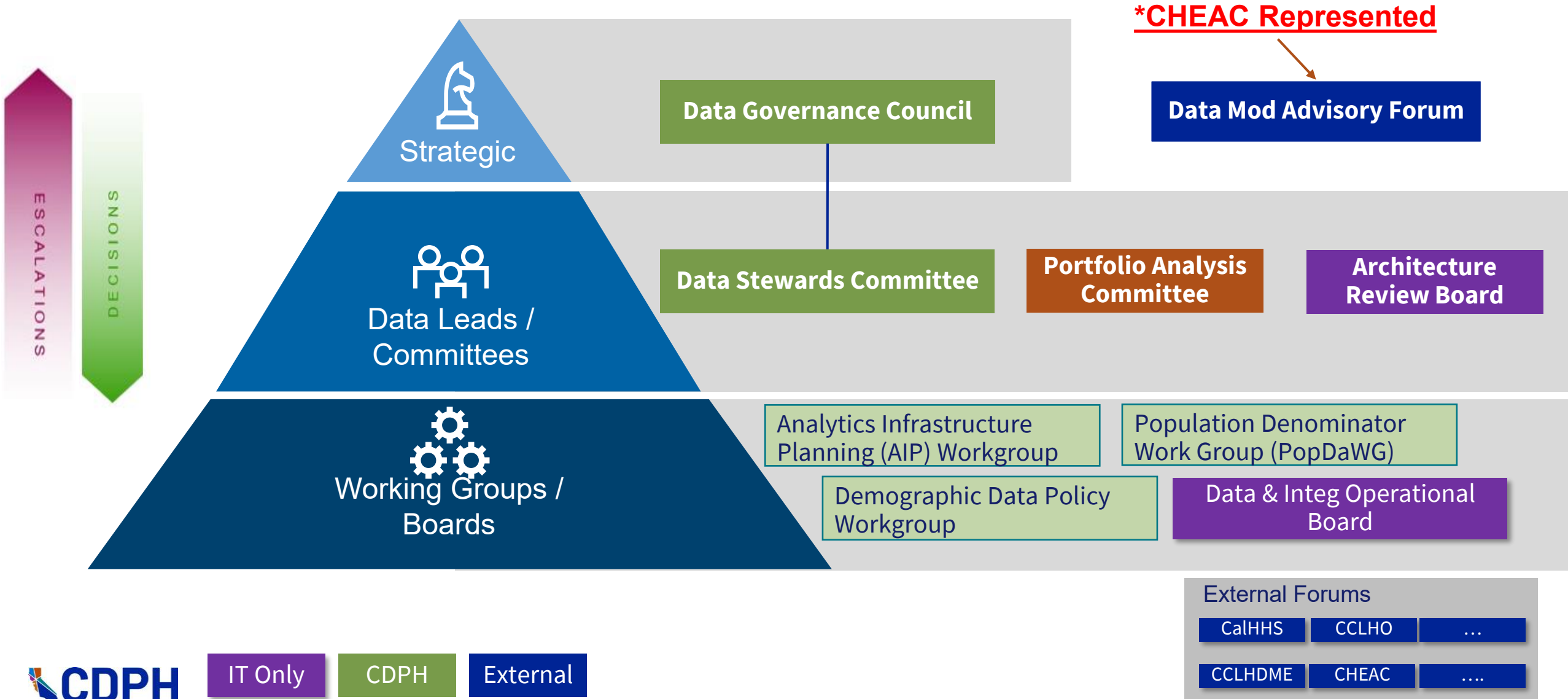
IT & Security Integration

Ensure your IT team and environment can support GenAI tools including APIs, cloud platforms, and supporting data ecosystems

Built for AI



CDPH's Data Governance Structure: A Framework for Critical Decisions





Generative AI Initiatives

Microsoft Security Copilot



Security Copilot

Ask anything about security

CDPH Built their own before they could buy but have since transitioned to the COTS solution

GenAI security assistant that helps detect, investigate, and respond to threats.

- Automatically triages complex alerts, summarizes incidents, and provides step-by-step remediation guidance
- Offers prioritized risk insights and AI-generated recommendations to improve organizational security posture across cloud and on-prem environments
- Translates natural language into KQL or script analysis, enabling analysts to hunt threats or analyze suspicious code without deep technical scripting knowledge
- Analyzes malicious code giving an in-depth breakdown of which parts of the code are malicious and why.



Microsoft 365 Copilot

AI-Powered Productivity Assistant

Integrates large language models with Microsoft 365 apps like Word, Excel, PowerPoint, Outlook, and Teams to enhance productivity.

Context-Aware

Uses your organization's "grounding" data (emails, documents, meetings, chats) to provide personalized, contextual assistance.

Streamlines Work

Helps draft documents, summarize meetings, analyze data, and generate presentations (like this one).

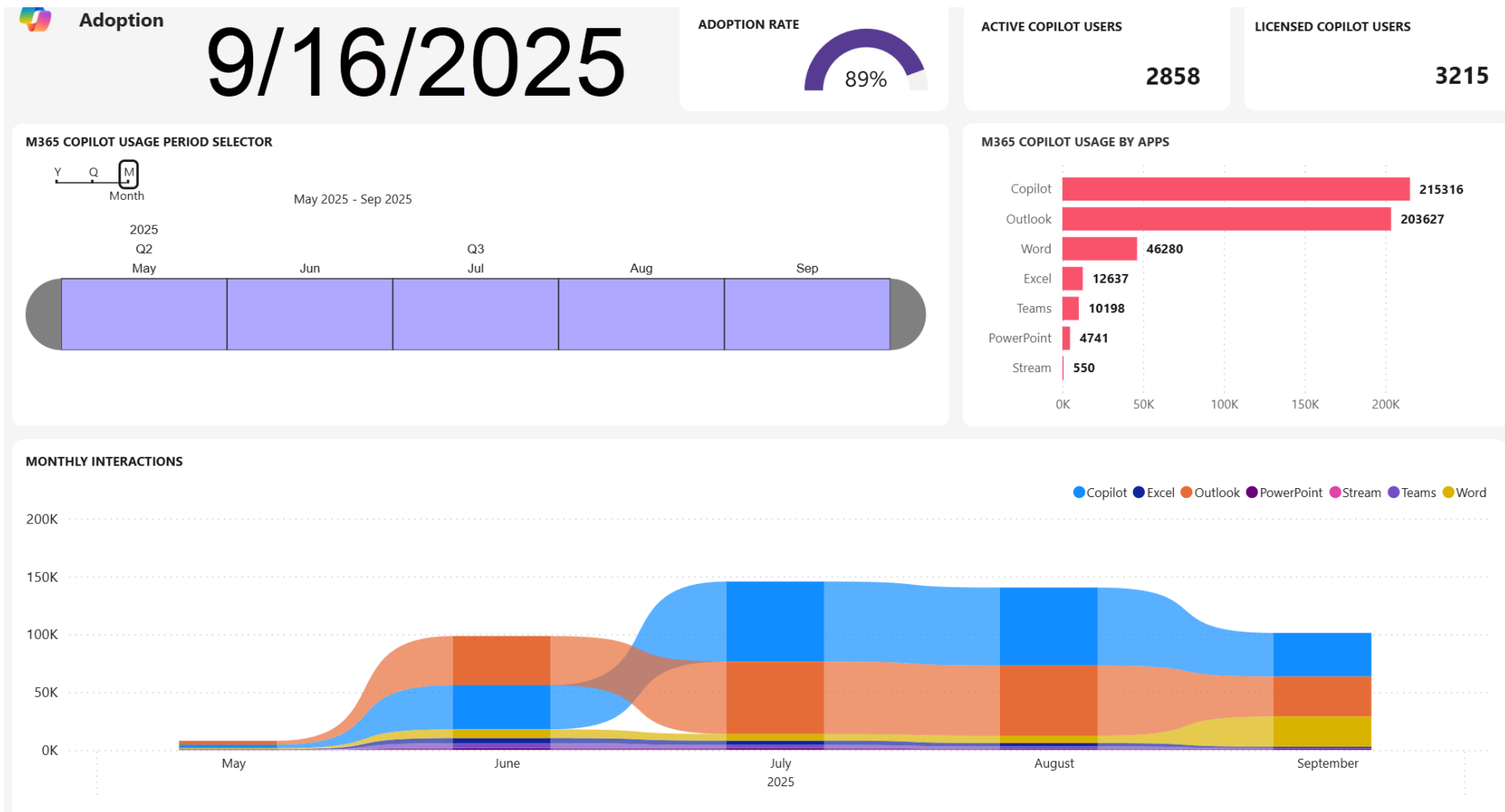
Secure (When Done Right)

Honors traditional role-based security boundaries in M365 and Purview sensitivity label-based policies.

Primary Timeline



Measuring Adoption



Azure OpenAI

“Chat With Your Data” Solutions
Accelerator on GitHub

Conversational AI on Your Data

Enables natural language chat experiences over your curated, unstructured enterprise data using Azure OpenAI and Azure AI Search.

Enterprise-Ready Architecture

Offers a customizable Retrieval-Augmented Generation (RAG) framework with support for secure deployment in your own Azure subscription, including Teams integration and speech-to-text capabilities.

Rapid Deployment & Flexibility

Provides a ready-to-deploy solution with support for multiple file types, ingestion methods (push/pull), and orchestration tools like LangChain, Semantic Kernel, and Prompt Flow.

Built for Customization & Experimentation

Designed for developers and IT teams to tailor prompts, retrieval strategies, and data flows.



Created with DALL-E Prompt
"Logo for California Department of Public Health AI Assistant"

Start chatting

This chatbot will do its best to answer questions but may not respond accurately. Generated content should be reviewed for accuracy and appropriateness before use.



Type a new question...





Tell me about CDPH's position on diversity and inclusion

CDPH emphasizes the importance of diversity, equity, and inclusion as foundational to its success, recognizing that differences in identity, thought, and experience are essential for forming effective policies, developing resources, and delivering services to California's diverse communities ¹. The department is committed to fostering a work culture where all employees are inspired to share their talents and ideas, contributing to innovative solutions and quality resources that better serve the needs of California's communities ¹. CDPH strives to create an environment where all employees are included, treated with dignity and respect, and empowered to protect the health of all Californians ¹. *external

AI-generated content may be incorrect

1 reference ▾



[1 CDPH Diversity Equity and Inclusion.docx - Part 0](#)

Write a brief social media post about the importance of this for Facebook

🌟 At CDPH, diversity, equity, and inclusion aren't just buzzwords—they're the foundation of our mission to serve California's communities. By embracing our differences and fostering a workplace where every voice is valued, we create innovative solutions and deliver quality resources that protect the health of all Californians. Together, we're building a culture of respect, empowerment, and shared purpose. ❤️ #DEI #PublicHealth #Respect4All

AI-generated content may be incorrect

Type a new question...

Azure OpenAI Service

Private

































- Private service running in your own tenant doesn't use your data to train.

Flexible

- Multiple models to choose from. Not as constrained as M365 for GCC customers.

Consumption Plans

- Pay-as-you-go lets you pay only for the Azure OpenAI resources you use, but has limitations - \$
- Provisioned Throughput Units (PTUs) reserve dedicated capacity for consistent performance and predictable costs - \$\$\$

 model-router Chat completion	 gpt-4.1-nano Chat completion	 o1-preview Chat completion
 gpt-audio Audio generation	 gpt-4.5-preview Chat completion	 gpt-4 Chat completion
 gpt-realtime Audio generation	 o3-mini Chat completion	 dall-e-3 Text to image
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Regulatory Evaluation GenAI Inspection System

Center For Health Care Quality (CHCQ)

Amongst other things, responsible for deploying Health Facility Evaluation Nurses (HFEN's) to investigate complaints at care facilities.

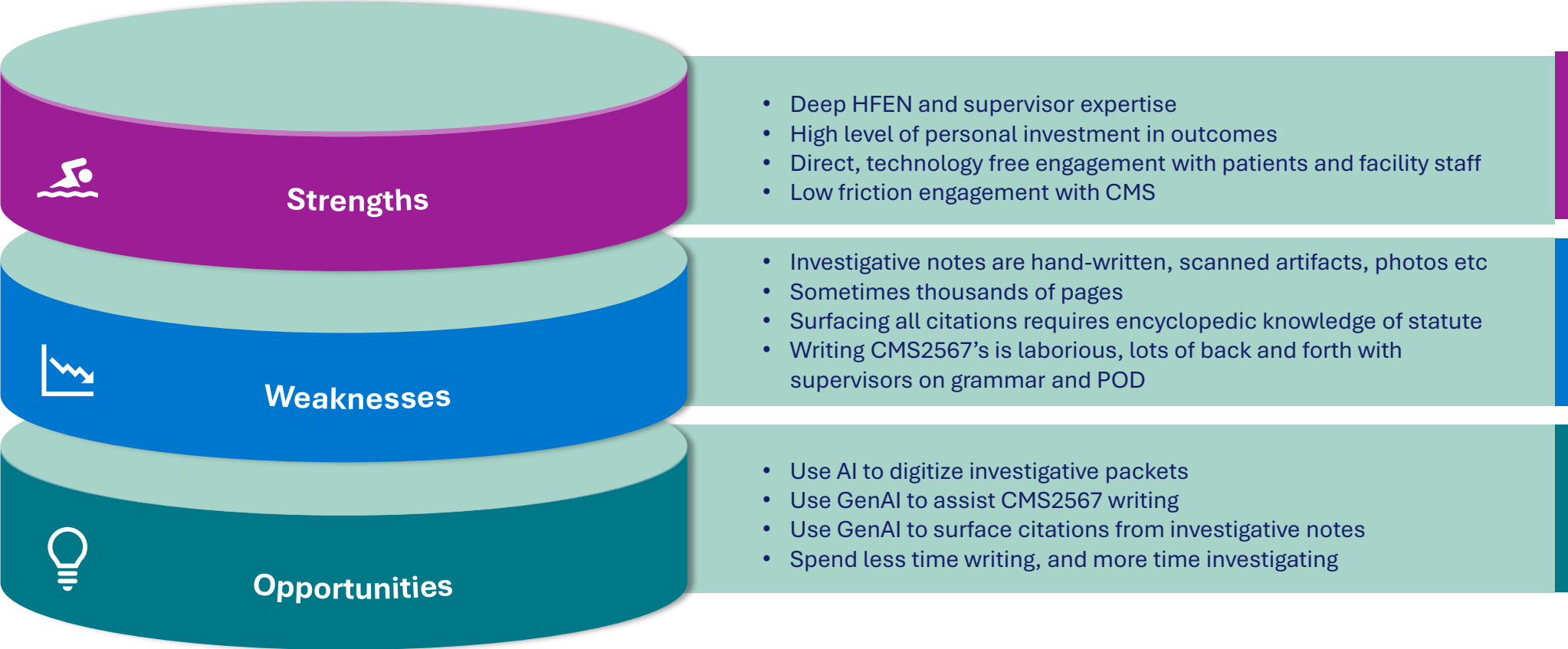
Centers for Medicare and Medicaid Services (CMS) 2567

A statement of deficiencies and plan of corrective action. The final report sent from HFEN's to CMS for approval and enforcement activities.

Comprehensiveness, Accuracy and Speed

Velocity can have a direct real-world impact on patient care.

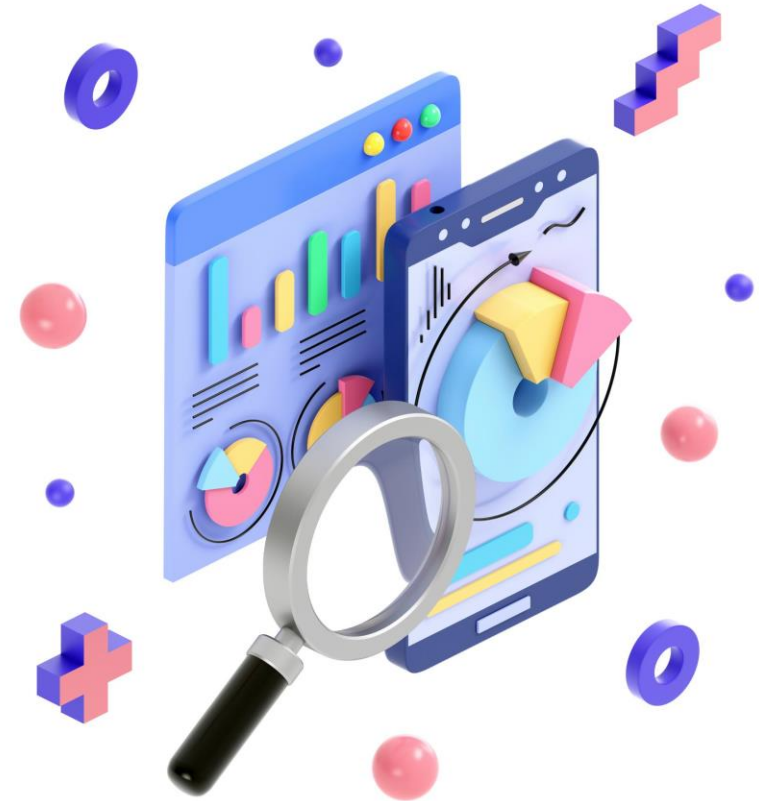
Current Process



Innovation Solicitation

State RFI2 Process

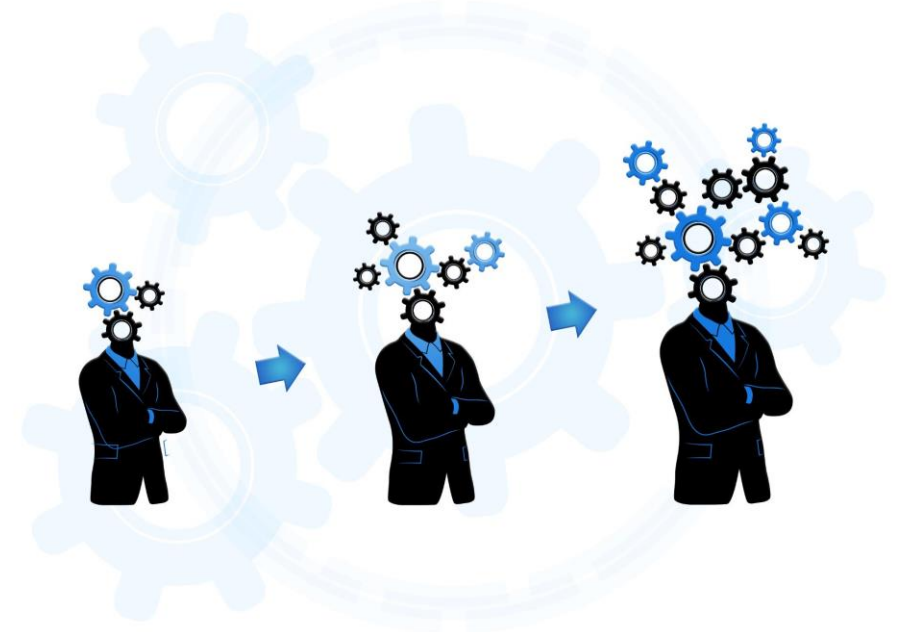
- RFI problem statement published
- Two vendors selected for 1\$ POC
- POC's conducted in State managed clouds with public, synthetic or deidentified data
- Measure effectiveness and potentially pick a vendor to move forward with



Digitization: Two Approaches

CDPH recommended a state-of-the-art hybrid approach: OCR + AI Vision

- Vendor 1 (combined approach)
 - ~97% accuracy in handwritten text conversion
 - Potential for greater contextual analysis
- Vendor 2 (OCR only approach)
 - <80% accuracy
 - No potential for contextual analysis



Results & Next Steps

Testing showed promise

- Positive user feedback
- Accurate document conversion
- Streamlined workflow
- Appropriate citations surfaced
- CMS2567's written with high degree of accuracy

Funding on hold

- Foundational components being implemented in house for future effort





Governance Considerations

Establishing GenAI Governance Frameworks

Define Vision, Scope, and Guiding Principles

Articulate the agency's purpose for using GenAI, aligned with public health values such as equity, transparency, and accountability.

Form a Cross-Functional Governance Body

Create a steering committee with representatives from IT, Security, legal, ethics, public health programs, and community engagement to oversee GenAI strategy and risk management.

Develop Foundational Policies and Standards

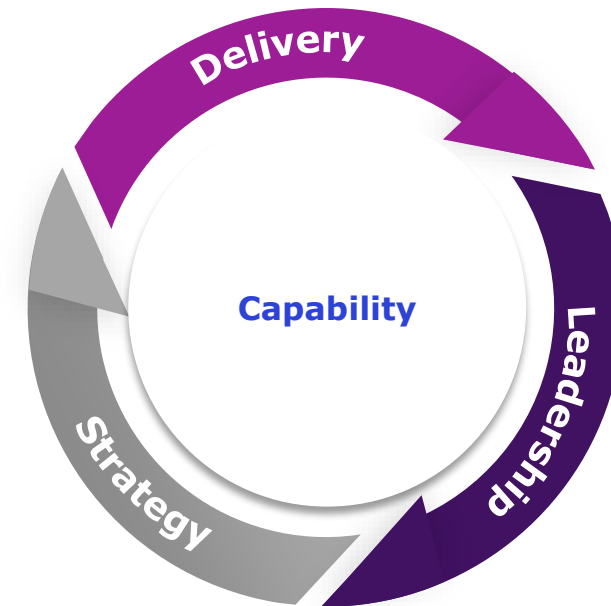
Draft and adopt policies covering GenAI use, ethics, data governance, model validation, procurement, and lifecycle management.

Inventory and Assess Existing AI Use Cases

Conduct an agency-wide assessment of current and planned GenAI projects to identify risks, gaps, and opportunities for standardization.

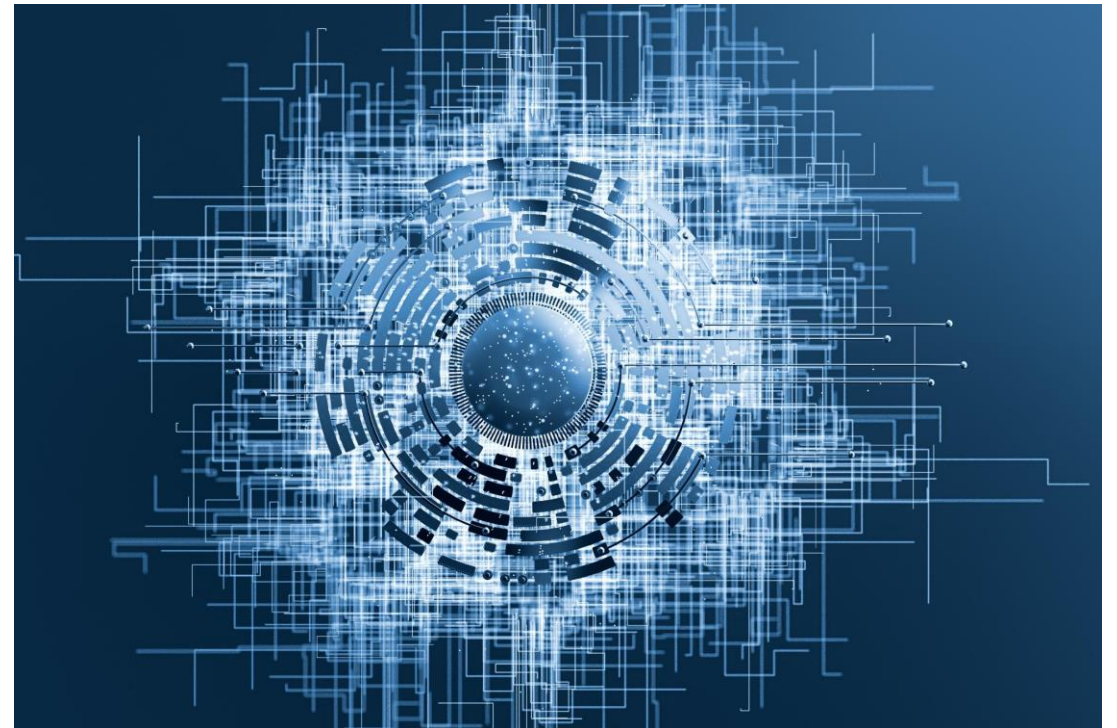
Establish Risk-Based Oversight Mechanisms

Implement tiered review processes based on the potential impact of GenAI systems on health outcomes, equity, and public trust.



Ensuring Accountability and Transparency

- Emphasize the importance of accountability in utilizing GenAI systems to ensure responsible usage and governance.
- Clear communication of GenAI processes and decision-making criteria is essential for building and maintaining staff and public trust.
- Whenever possible log GenAI usage, study prompts and refine training and processes



Regulatory Compliance

- Compliance with regulations ensures that GenAI technology is utilized responsibly within public health frameworks and demonstrates competence with control agencies.
- Building compliant solutions from the start is easier than remediating them after the fact

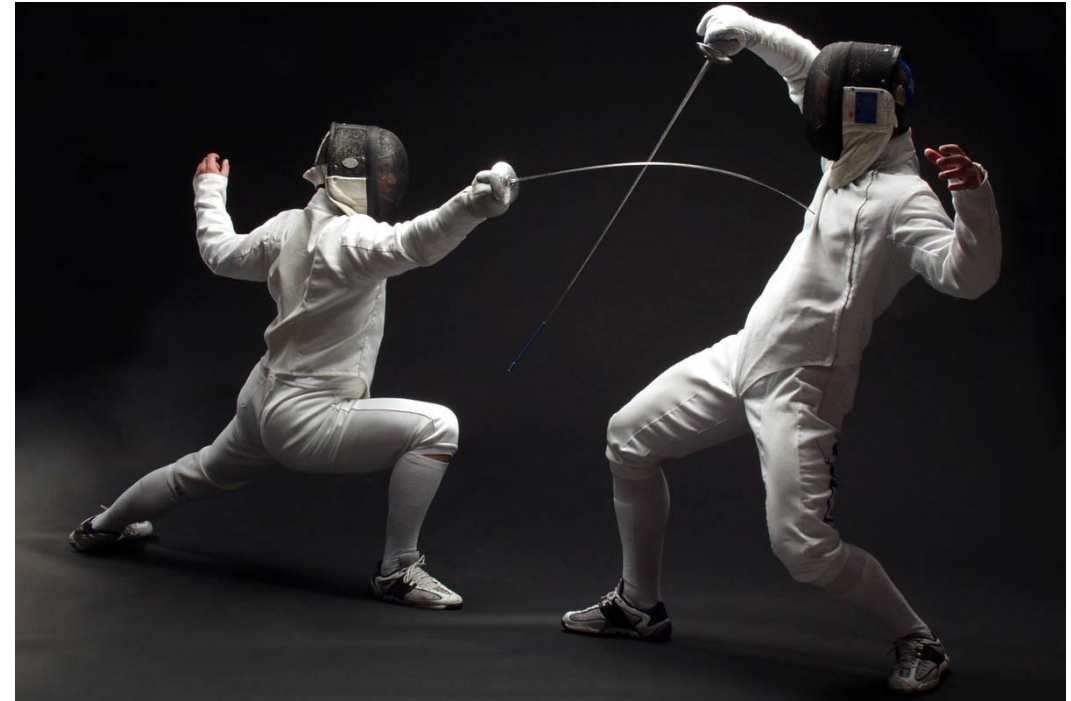




Privacy and Security Measures

New Service, Same Strategies

- In most scenarios, GenAI is just a new service in a technology stack that should be protected in the same way you'd protect any other service
 - Use private endpoints
 - Securely manage and use customer owned API keys
 - Practice Zero-Trust
 - Authenticate everything
 - Segmentation
 - Encryption



Threat Actors Have It Too

Nation States, Cybercriminals, Extortionists, Political Actors and run of the mill hackers all benefit:

- Phishing & Social Engineering
- Reconnaissance
- Malware Development
- Deepfakes
- Identity Fraud

Security teams need specialized training, additional resources.

Executive teams need contingency plans, public relations planning and social media monitoring skills





Equity and Ethical Considerations

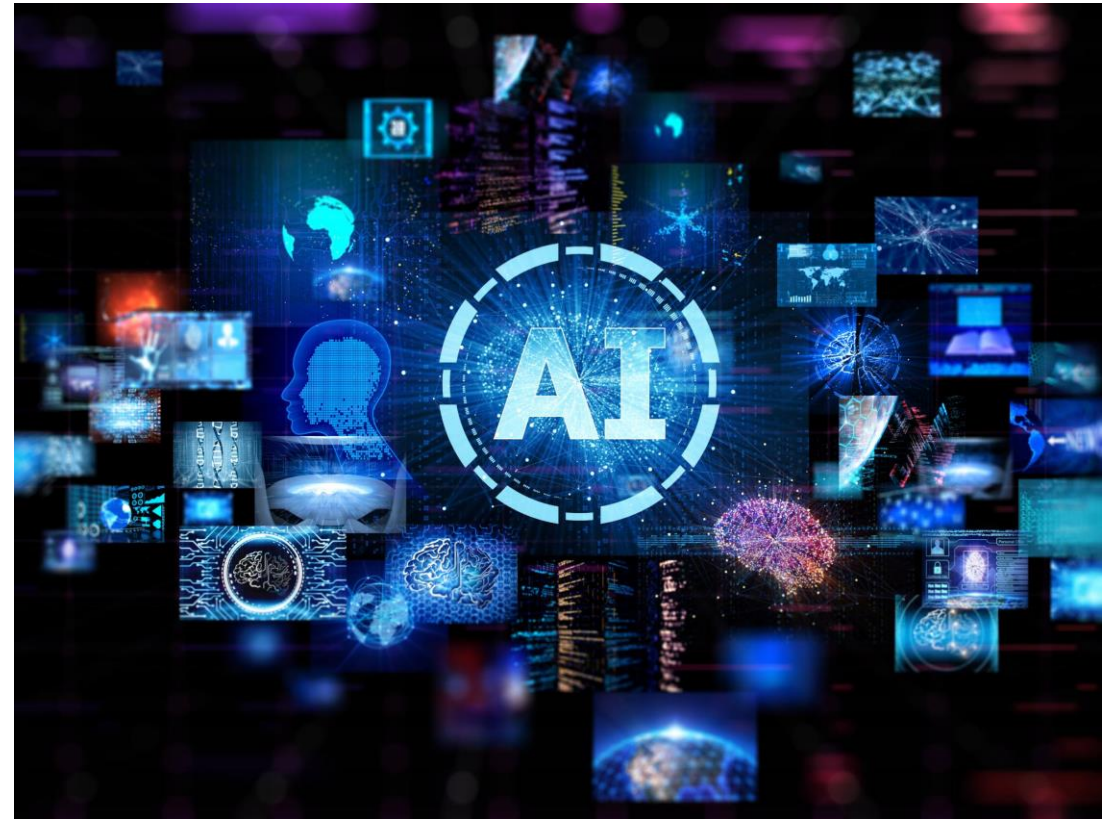
Bias in GenAI

It's gotten better...

- Improved Training Data Practices
- Advanced Technical Strategies
- Explainability and Fairness Metrics

But is still far from perfect

- Stereotype amplification
- Context-specific bias
- Hallucinations Compound Bias



Equitable Access

Productivity tools

Consider the impacts of restricted enablement

Multilingual and Culturally Inclusive

Seek out and support GenAI systems that understand and generate content in multiple languages and dialects and reflect diverse cultural contexts and values.

Ensure Accessibility for People with Disabilities

Integrate GenAI with assistive technologies (e.g., screen readers, voice input) and follow WCAG and ADA standards to ensure inclusive design.

“AI is not a substitute for human intelligence. It is a tool to amplify it. But we must design it with empathy and ensure equitable access to its benefits.”

Fei-Fei Li – Stanford Professor & AI Ethics Advocate

State of CA and CDC Mitigations

GenAI.ca.gov equity guidelines

Pre-procurement equity evaluations to assess potential harms to vulnerable communities.

Community engagement to co-design and monitor GenAI deployments.

Iterative assessments throughout the AI lifecycle to ensure equitable outcomes.

The CDC and Network for Public Health Law also emphasize:

Embedding "human-in-the-loop" safeguards.

Developing ethical frameworks tailored to public health contexts.





The Future of GenAI

Agentic AI Core Concepts

Autonomy

Agentic AIs can operate without constant human input.

Goal-Directed Behavior

Designed to pursue specific objectives, which may be predefined or learned.

Memory and Learning

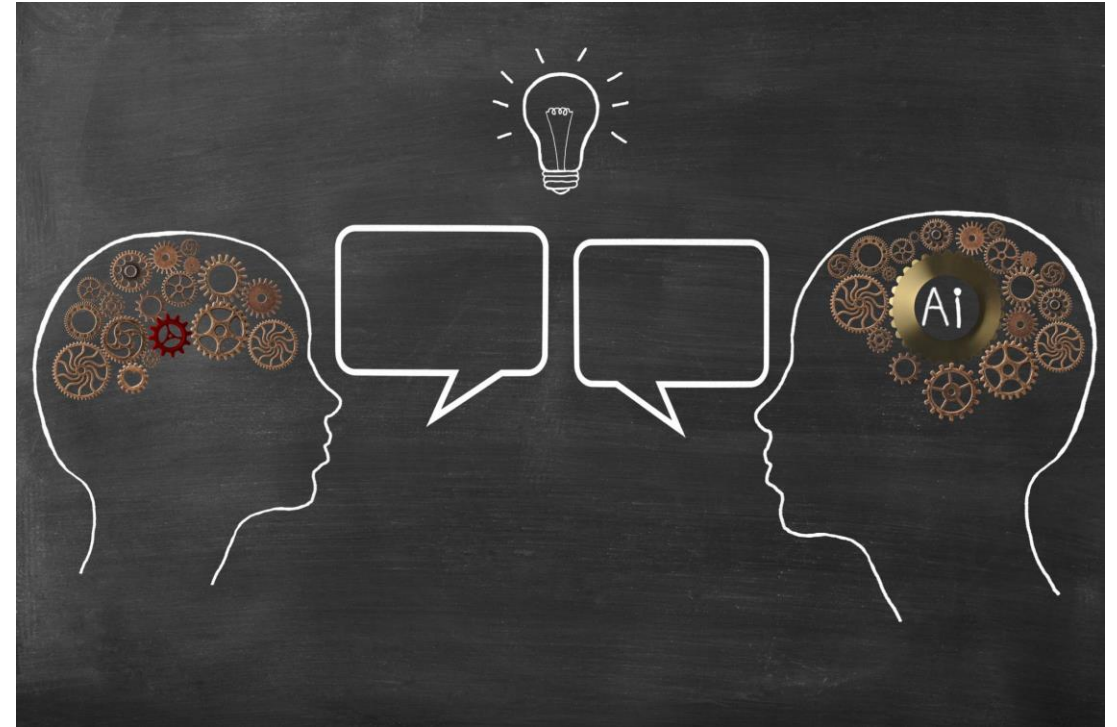
Agentic systems often include long-term memory and learning mechanisms

Tool Use

They can interact with external tools, APIs, or environments

Self-Reflection/Reasoning

Advanced agentic AIs may engage in meta-cognition, reasoning about their own reasoning



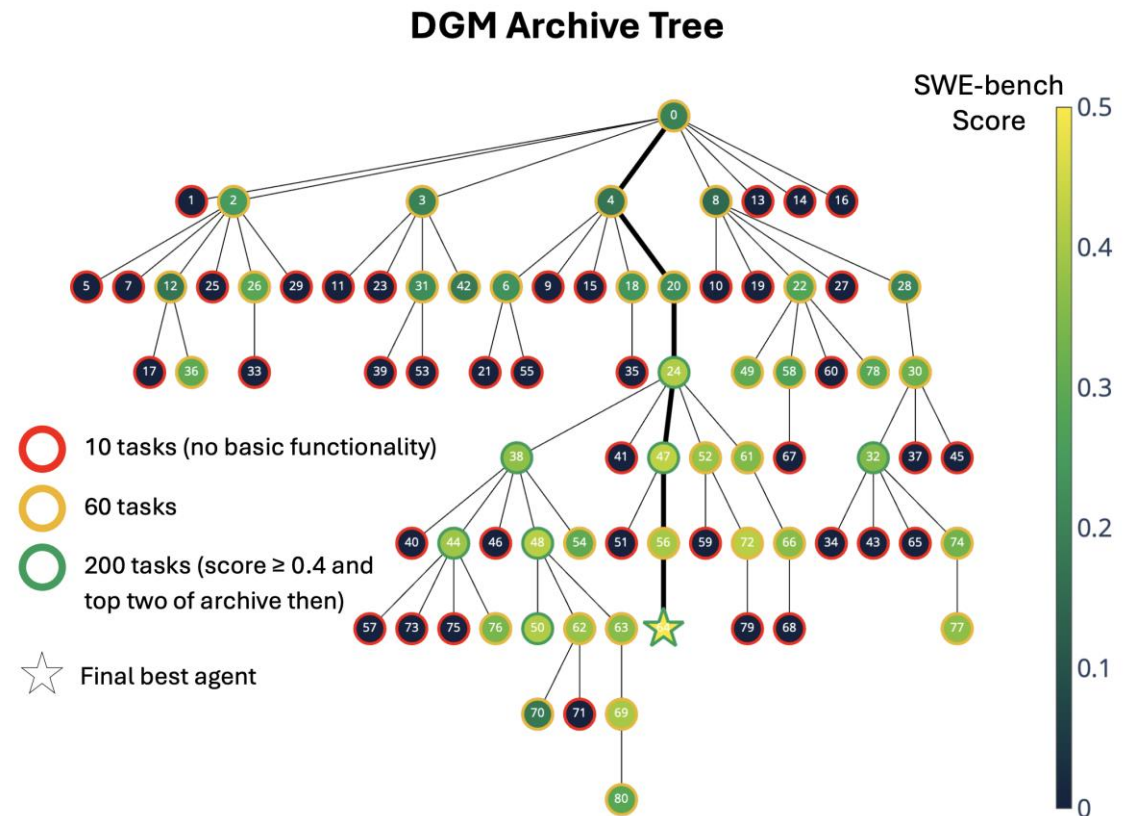
The Darwin Gödel Machine (DGM): Self-Improving AI

Rewrites its own code to improve performance on programming tasks.

Applies Darwinian evolution principles to explore a wide range of self-improvement paths.

Maintains an archive of agents, allowing it to evolve novel solutions over time.

Demonstrated cross-model and cross-language transferability, meaning improvements generalized across different AI systems and programming languages



<https://sakana.ai/dgm/>

AI “Superintelligence” Considerations

Control

How do we ensure humans can control or influence a vastly more intelligent system?

Values

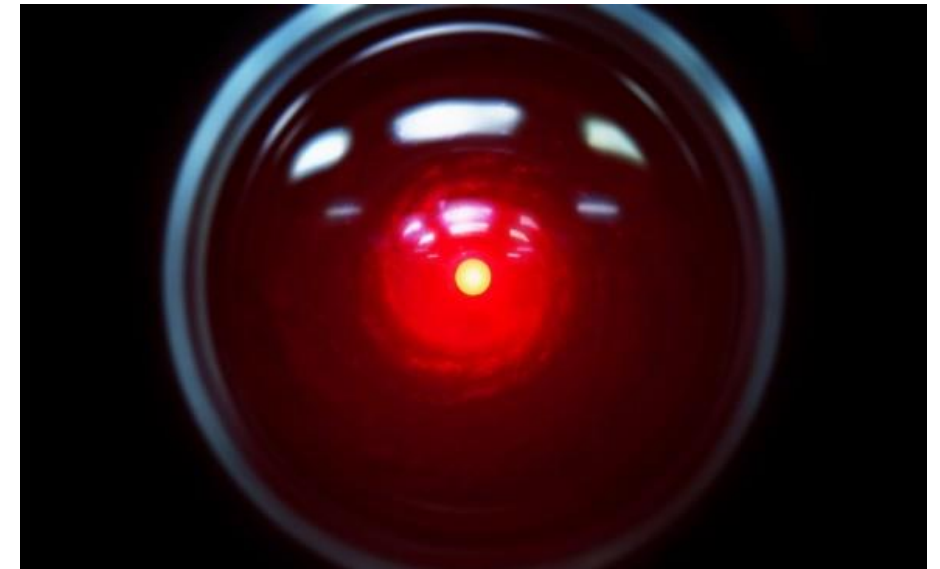
How do we encode human values in a way that a superintelligent AI can understand and respect?

Existential Risk

If misaligned, such an AI could pose a threat to humanity’s survival.

Power Imbalance

Monopolized by a single entity or nation, leading to global inequality or authoritarianism.



In Closing: GenAI Applications in Public Health

Fundamentally make public health agencies more responsive, equitable, and efficient.

Enhanced Public Engagement

Accelerated Grant and Policy Drafting

Surveillance Using Unstructured Data

Workforce Training and Simulation



