CALSTRS | >

State of AI

July Board Offsite

12:30 – 4:15 PM | Wednesday July 24, 2024

Session Overview

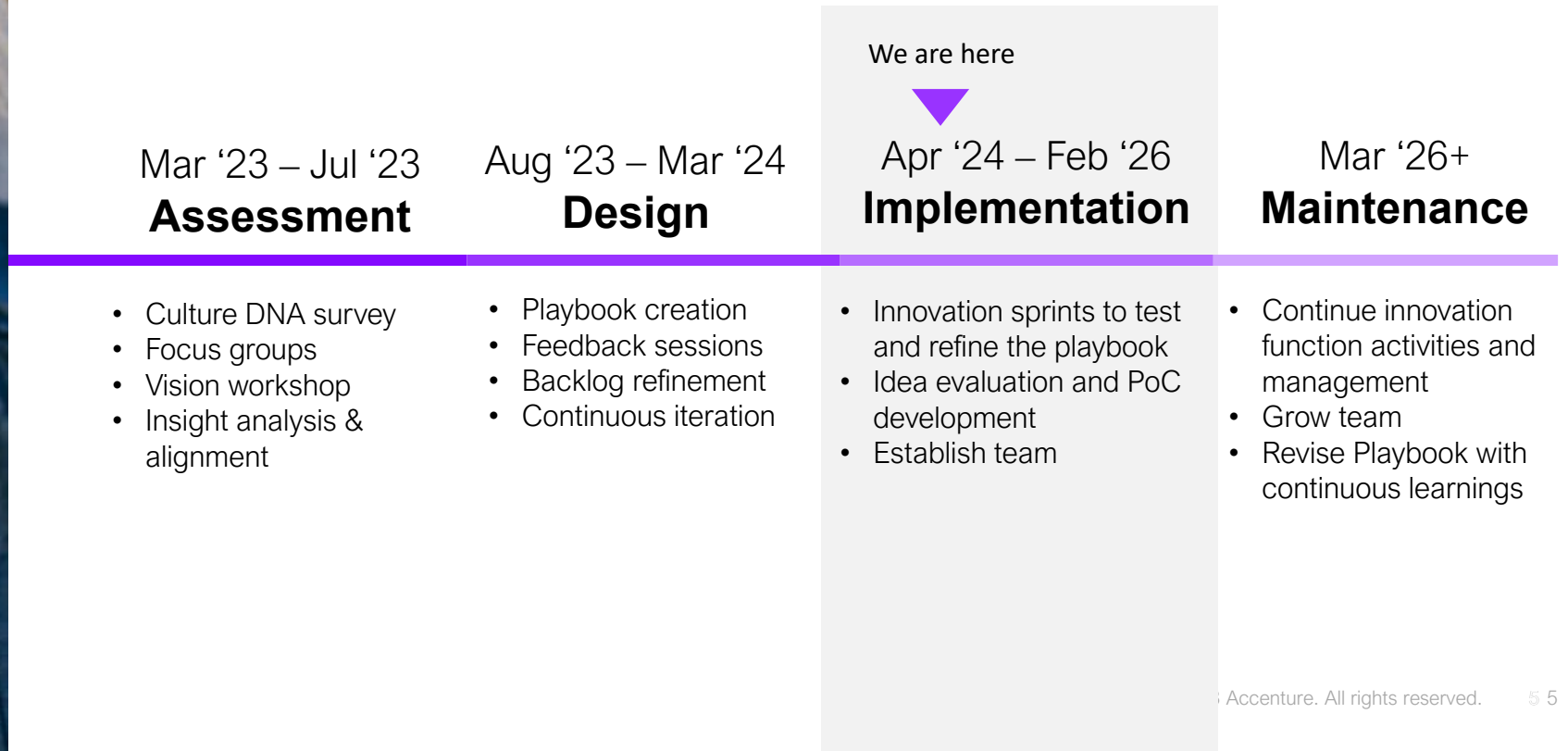# GenAI is one of many potential enablers for innovation.

Innovation is a new way of doing things to evolve the experiences of our members and our people.
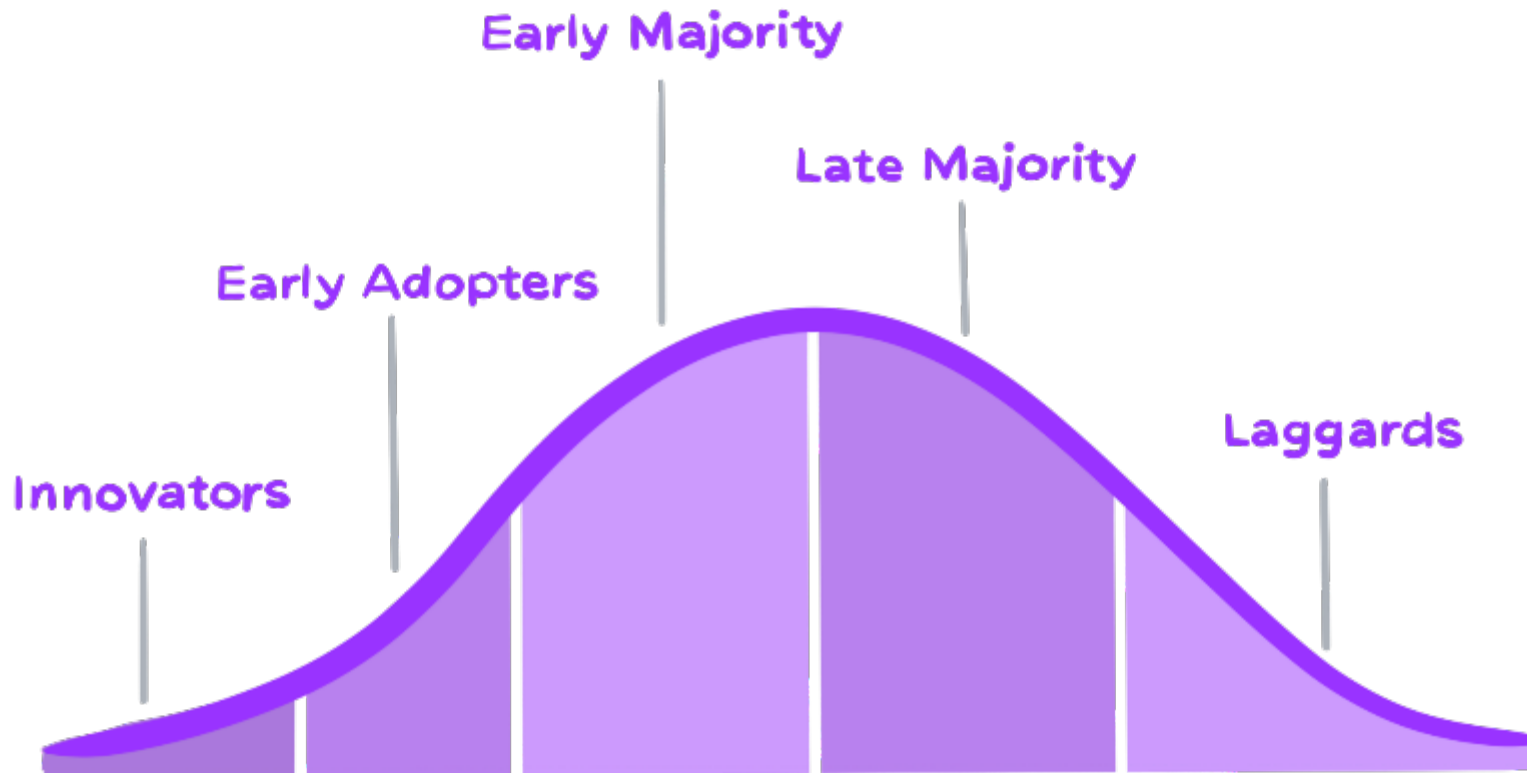
Our Innovation Journey

CalSTRS has embarked on a three-year journey to become a more innovative organization. In partnership with Accenture, we have mapped out a four-phase plan to **assess** the current state of our culture and capabilities, set a vision, **design** and **implement** the future state, and **maintain** and evolve the program.
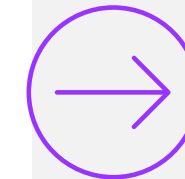
We are here

Mar '23 – Jul '23 **Assessment**	Aug '23 – Mar '24 **Design**	Apr '24 – Feb '26 **Implementation**	Mar '26+ **Maintenance**
• Culture DNA survey • Focus groups • Vision workshop • Insight analysis & alignment	• Playbook creation • Feedback sessions • Backlog refinement • Continuous iteration	• Innovation sprints to test and refine the playbook • Idea evaluation and PoC development • Establish team	• Continue innovation function activities and management • Grow team • Revise Playbook with continuous learnings

Where do you think CalSTRS should be on the innovation adoption curve for GenAI?

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→ Please use your phone or laptop to go to menti.com, enter the code and submit your response.

Early Majority

Late Majority

Early Adopters

Laggards

Innovators

Menti Results

Today's Objectives

Build a **common understanding** of GenAI and where CalSTRS currently is on our AI journey.
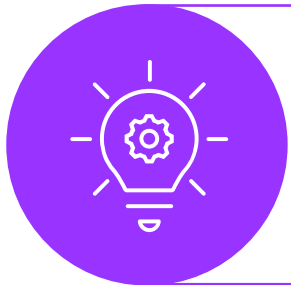
Get input for a **shared vision** of the future of GenAI at CalSTRS.

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Agenda

12:30 PM	**Session Overview**
12:40 PM	**Understanding GenAI**
1:15 PM	**Panel Discussion**
2:00 PM	**Break**
2:15 PM	**AI at CalSTRS: Current Practices and Our Immediate Horizon**
3:00 PM	**Breakout Groups**
3:45 PM	**Shareback + Next Steps**

Understanding GenAI

Economic Impact of GenAI

Ecosystem Investment

Technology companies are investing in AI more than any other technology

$130B

Economic Impact

GenAI could increase global GDP by

GenAI could increase annual US GDP by

Up to **$7T**

1.5%

Catapulted by advances in GenAI, Technology is the no. 1 cause of change

76% of executives saw GenAI as more of an opportunity than a threat

Only **27%** of executives claim their organizations are ready to scale up GenAI.

95% of executives believe GenAI will compel their organization to modernize its tech architecture

(Accenture research)

GenAI has become a top priority for the Executives

80% of conversational AI offerings will have GenAI embedded by 2025, up from 20% in 2023.

90% of service providers will use GenAI for software development services by 2027

(Gartner)

GenAI is a step change in the evolution of AI.

Machine Learning: Analysis and Prediction Phase

Deep Learning: Vision and Speech Phase
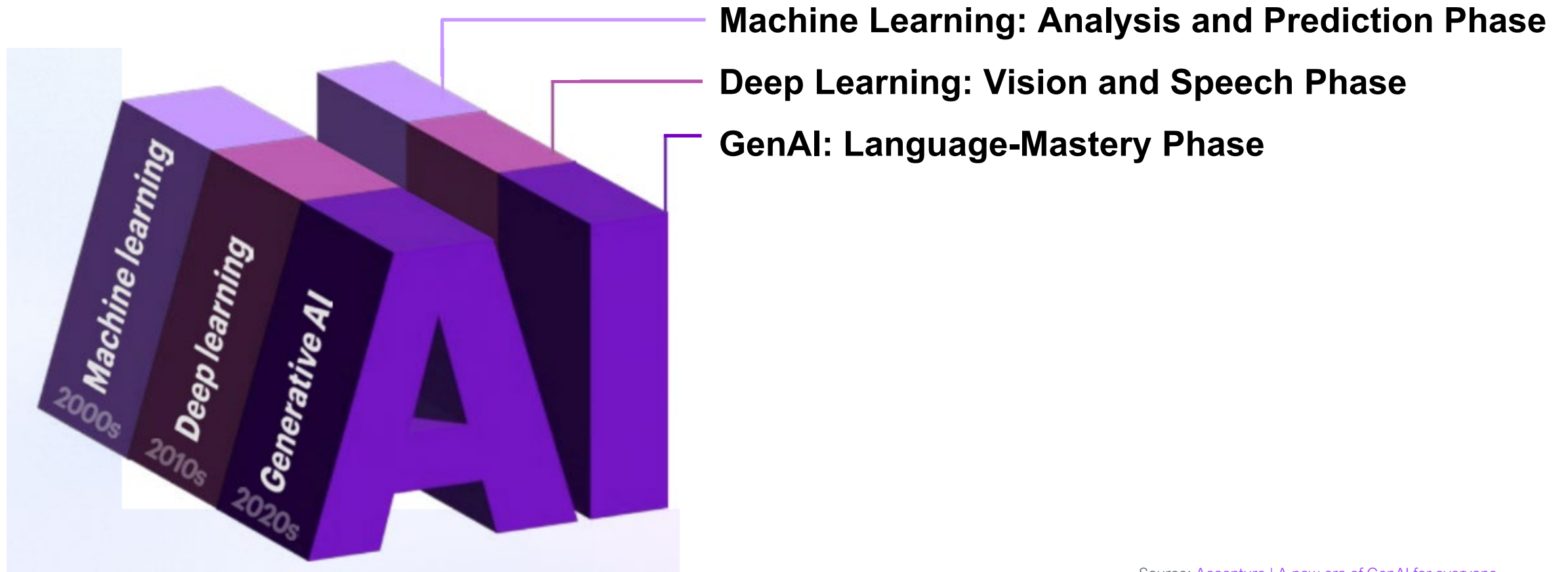
GenAI: Language-Mastery Phase

Open vs Closed GenAI

Open GenAI

A system where the source code, algorithms, and data are openly available for public usage. **It uses publicly available and potentially copyrighted information.**

Examples of open AI include open-source machine learning tools like ChatGPT.

Benefits include accessibility and shared participation.

Drawbacks include data security and data privacy, copyright issues, and quality control.

Closed GenAI

A system that uses information that come from closed sources, making sure information is accurate and secure. **Algorithms and data are proprietary and not openly shared with the public.**

Examples of closed AI include products such M365 Co-Pilot.

Benefits include quality control and assurance, protection of proprietary data, consistency and reliability. Necessary safeguards are in place with Open GenAI to ensure security.

How does it work?

There are **multiple essential layers** below the surface of GenAI applications.
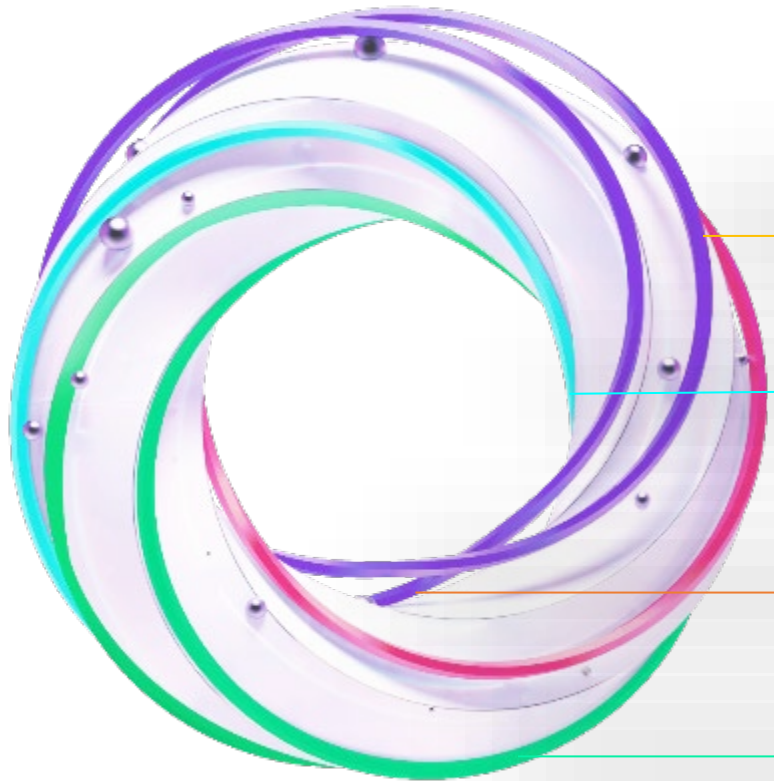
Essential elements to increase your intelligence index

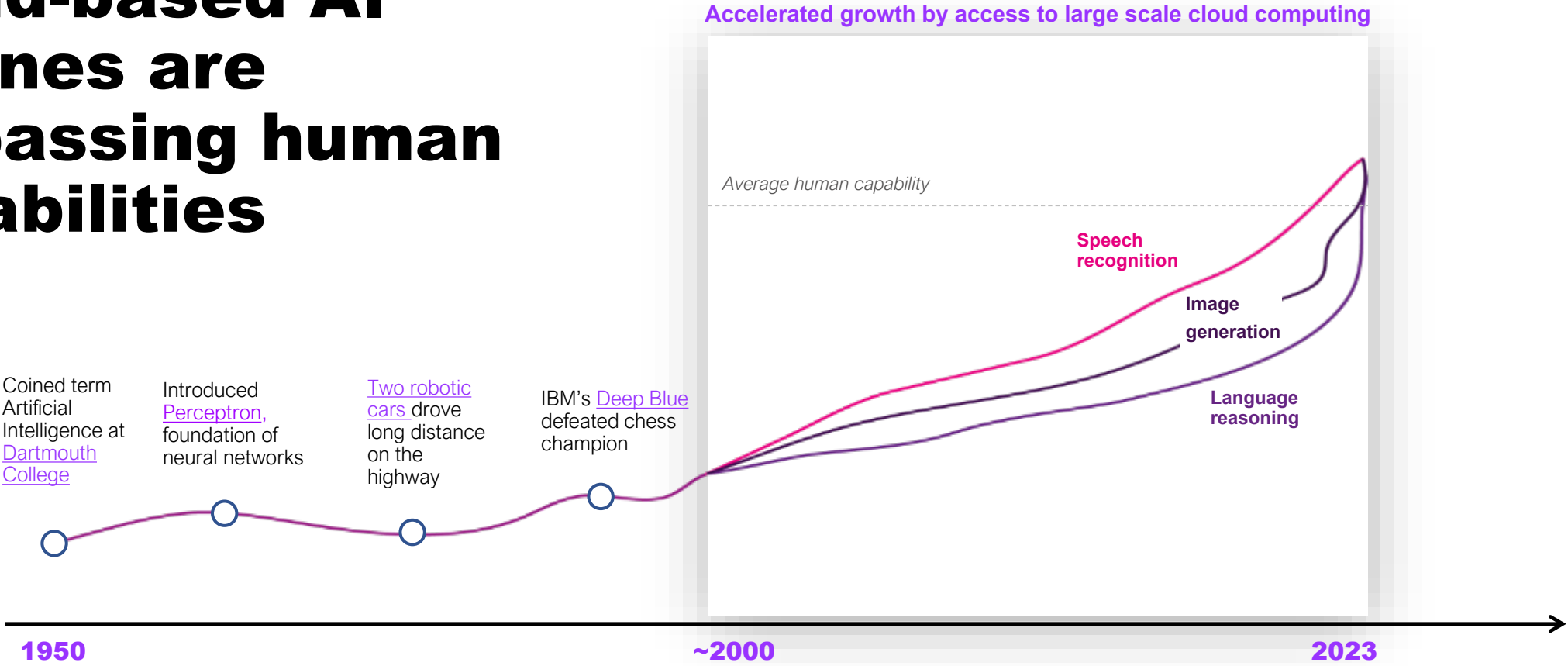|	
Applications	User interface layer that uses data from foundational model to generate content **Examples: ChatGPT (or GenAI chatbots built on foundation models)**
Fine-Tuning	Process by which foundation models are adapted for specific downstream tasks using a particular dataset **Examples: train a model to compose emails based on your personal writing style**
Foundation Model	Complex machine learning systems trained on vast quantities of data (text, images, audio, or a mix of data types) on a massive scale **Examples: GPT-3, DALL-E 2**
Data	A fundamental base of GenAI, for training and fine-tuning foundational models **Examples: internet text, including websites, books and articles**

Cloud-based AI engines are surpassing human capabilities

Accelerated growth by access to large scale cloud computing

Average human capability

Speech recognition

Image generation

Language reasoning

Coined term Artificial Intelligence at Dartmouth College

Introduced Perceptron, foundation of neural networks

Two robotic cars drove long distance on the highway

IBM's Deep Blue defeated chess champion

1950

~2000

2023

We are at an inflection point where AI capabilities are reaching and driving beyond human capabilities at generalized skills

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GenAI will transform work across every job category

Take a people-first approach

Success with generative AI requires an equal attention on people and training as it does on technology. Companies should therefore dramatically ramp up investment in talent to address two distinct challenges: creating AI and using AI. This means both building talent in technical competencies like AI engineering and enterprise architecture and training people across the organization to work effectively with AI-infused processes. In our analysis across 22 job categories, for example, we found that LLMs will impact every category, ranging from 9% of a workday at the low end to 63% at the high end. More than half of working hours in 5 of the 22 occupations can be transformed by LLMs.
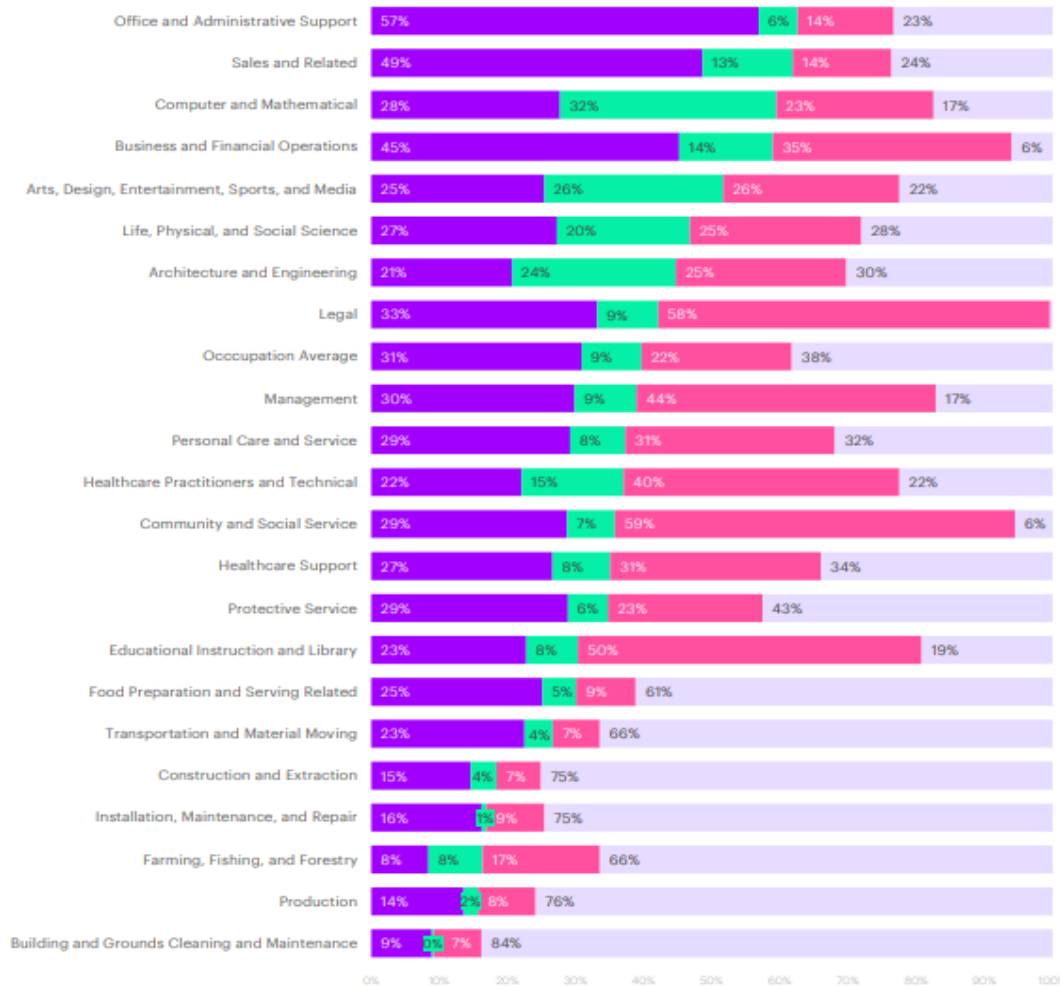
Work time distribution by major occupation and potential AI impact
Based on their employment levels in the US in 2021

	Higher potential for automation	Higher potential for augmentation	Lower potential for augmentation or automation	Non-language tasks

In 5 out of 22 occupation groups, Generative AI can affect more than half of all hours worked

Occupation	Higher potential for automation	Higher potential for augmentation	Lower potential for augmentation or automation	Non-language tasks
Office and Administrative Support	57%	6%	14%	23%
Sales and Related	49%	13%	14%	24%
Computer and Mathematical	28%	32%	23%	17%
Business and Financial Operations	45%	14%	35%	6%
Arts, Design, Entertainment, Sports, and Media	25%	26%	26%	22%
Life, Physical, and Social Science	27%	20%	25%	28%
Architecture and Engineering	21%	24%	25%	30%
Legal	33%	9%	58%	
Occupation Average	31%	9%	22%	38%
Management	30%	9%	44%	17%
Personal Care and Service	29%	8%	31%	32%
Healthcare Practitioners and Technical	22%	15%	40%	22%
Community and Social Service	29%	7%	59%	6%
Healthcare Support	27%	8%	31%	34%
Protective Service	29%	6%	23%	43%
Educational Instruction and Library	23%	8%	50%	19%
Food Preparation and Serving Related	25%	5%	9%	61%
Transportation and Material Moving	23%	4%	7%	66%
Construction and Extraction	15%	4%	7%	75%
Installation, Maintenance, and Repair	16%	1%	9%	75%
Farming, Fishing, and Forestry	8%	8%	17%	66%
Production	14%	2%	8%	76%
Building and Grounds Cleaning and Maintenance	9%	1%	7%	84%

Source: Accenture Research based on analysis of Occupational Information Network (O*NET), US Dept. of Labor; US Bureau of Labor Statistics.

Notes: We manually identified 200 tasks related to language (out of 332 included in BLS), which were linked to industries using their share in each occupation and the occupations' employment level in each job category. Tasks with higher potential for automation can be transformed by LLMs with reduced involvement from a human worker. Tasks with higher potential for augmentation are those in which LLMs would need more involvement from human workers.

Source: Accenture research "A new Era of GenAI for Everyone", 22 March

16

GenAI is pushing creative expression forward by giving people tools to create content and can optimize organizations

Code

For developers who enabled it, 40% of their code is written by CoPilot, GitHub's AI assistant or AWS Codewhisperer. This will make the creative use of code more accessible to non-developers

Text

The most advanced domain, which has already passed Medical, Law, and Business exams. As models improve, we will see higher-quality outputs and longer-form content.
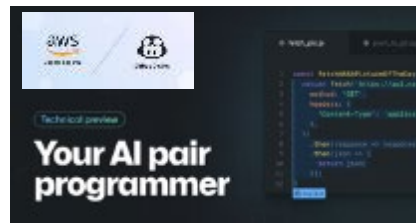
Video

The Crow, an AI movie, won the 2022 Cannes festival in the category of short films

Images

This is one of the most famous applications as the images AI can create are incredible and even won the top prize in a painting competition

Speech synthesis and translation

Whisper understands speech better than humans, even with background noise, and can translate between virtually any language.

Core building blocks for an organization's AI strategy

Governance

Value Targeting & Benchmarking

Risk and Responsible Use of GenAI

GenAI Policy

Use Cases

Strategy & Program Management Office

Service Design

Continuous Improvement

Strategy Roadmap & Vision

Performance Management

Blueprinting

Workflows & Process Models

Funding

Organizational Change Management

Technology Implementation

Architecture

Preparing, Planning, & Implementing:
GenAI Building Blocks to Guide GenAI Adoption

Strategy & Policy	Designing and Solutioning	Implementing & Scaling

Preparing & setting the stage for success

Planning, designing, and funding new ways of working

Implementing new ways of working & technology

Scaling & tracking to enable sustainable change

1 — GenAI Policy
Responsible AI Principles, Starter Set of Policies, Impact, Permissible Uses

2 — Governance
Roles, Responsibilities, Security, Owners, and Processes for decision making to drive GenAI strategically and tactically

3 — Security, Risk, and Responsible AI Assessments
Enterprise Readiness & Maturity, Environment & Implementation Risks, Cost, Pathways, Risk Management Framework

4 — Value Targeting & Benchmarking
Data driven insights, Performance & operational improvements, Value & Business Cases

5 — Use Cases
Functional Requirements, Impact, Applications of GenAI

6 — Service Design
Ideal Experience, Journey Maps, Storytelling, Personas

7 — Strategy Roadmap & Vision
People, Process, Technology, Sequence & Structure for change

8 — Blueprinting
Operating model, Organizational design, Ways of working, New "Workitecture", Distributed control / governance

9 — Funding
Sources of funds, Matching, Braiding, Models, Federal Funds, CapEx and OpEx, Savings

10 — Architecture
Enterprise & Technology Architecture Standards, Alternatives Analysis, Sourcing, & Solutions

11 — Technology Implementation
Implement GenAI Architecture Standards & Solutions

12 — Organizational Change Management
Training, Cultural Change Management, Workforce Development, Talent Management

13 — Workflows & Process Models
Implement Business Processes, Workflows, Use Cases & Service Design

14 — Performance Management
KPI's, Dashboards, Frameworks to track & monitor value and progress

15 — Continuous Improvement
Scalable & Sustainable Change, Enable Continuous Reinvention

16 — Strategy & Program Management Office
Continuous Implementation, New Value & Use Cases, Lessons Learned, Funding, Blueprinting, works with and activates GenAI COE
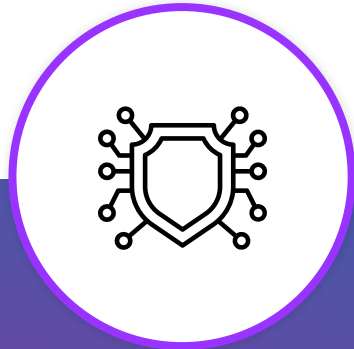
GenAI introduces some unique risks and challenges

Unreliable Outputs

- Hallucinations
- Explainability and traceability
- Quality, accuracy, interpretability
- Relevancy / consistency
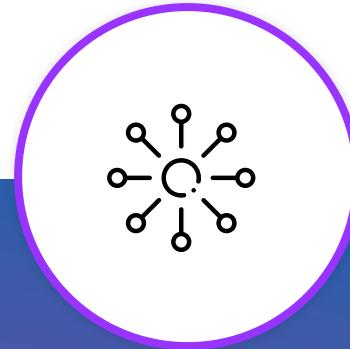- Disclosure & transparency

Confidentiality & Security

- Unauthorized disclosure of confidential information
- Security vulnerabilities

Liability & Compliance

- Copyright, IP, and content ownership
- Regulatory compliance
- Contractual liability
- Product liability
- Consumer protection concerns

Bias and Harm

- Representational harm
- Misinformation
- Toxicity
- Fraudulent attacks
- Disinformation spread
- Harmful content generation at scale

Workforce Shifts

- GenAI's impact viewed as more possible and direct for roles that were initially viewed as outside of AI's immediate reach (creatives, lawyers, etc.)

Responsible AI **Framework Augmentations** for GenAI

Principles & Governance

Uplift Responsible AI **Principles, Policy, Standards** and **governance to account for risks amplified by GenAI** and its democratized usage.

Establish **clear roles and responsibilities** and ensure and end-to-end framework for oversight and compliance.

Implement mechanisms for **accountability and transparency** and establish defined access and authorization protocols to **safeguard sensitive information**.

Risks, Policy, & Control

Adapt **current risk assessment, controls, & reporting/escalation paths** to incorporate new questions specific to risks posed by GenAI systems, including **human-in-the-loop reviews**.

Ensure Legal agrees **terms of use for foundation models and managed services**.

Consider **firmwide restrictions** on submitting confidential, proprietary, or personal data / information.
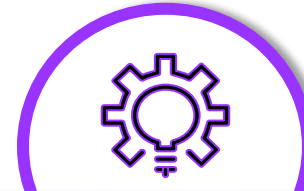
Technology Enablers

Ensure **transparency** for end users of the applications.

Apply **bias** and **data quality** checks to fine tune data and **mitigate hallucinations**.

Embed technical approaches for **accuracy, robustness, safety** and **explainability** into prompts and fine tuning.

Set up a **monitoring system** to review AI outputs & corresponding inputs. Check for **identifiable infringement** (eg, brands, personal data) or **problematic content** (e.g., offensive statements).

Culture & Training

Provide **firmwide guidance** and **training** on appropriate usage and risks of GenAI, and on **avoiding overstating its capabilities**.

Produce **technical guidance** and **standards** for risk mitigation when developing GenAI solutions.

Panel Discussion

Break

⏱ 15 mins

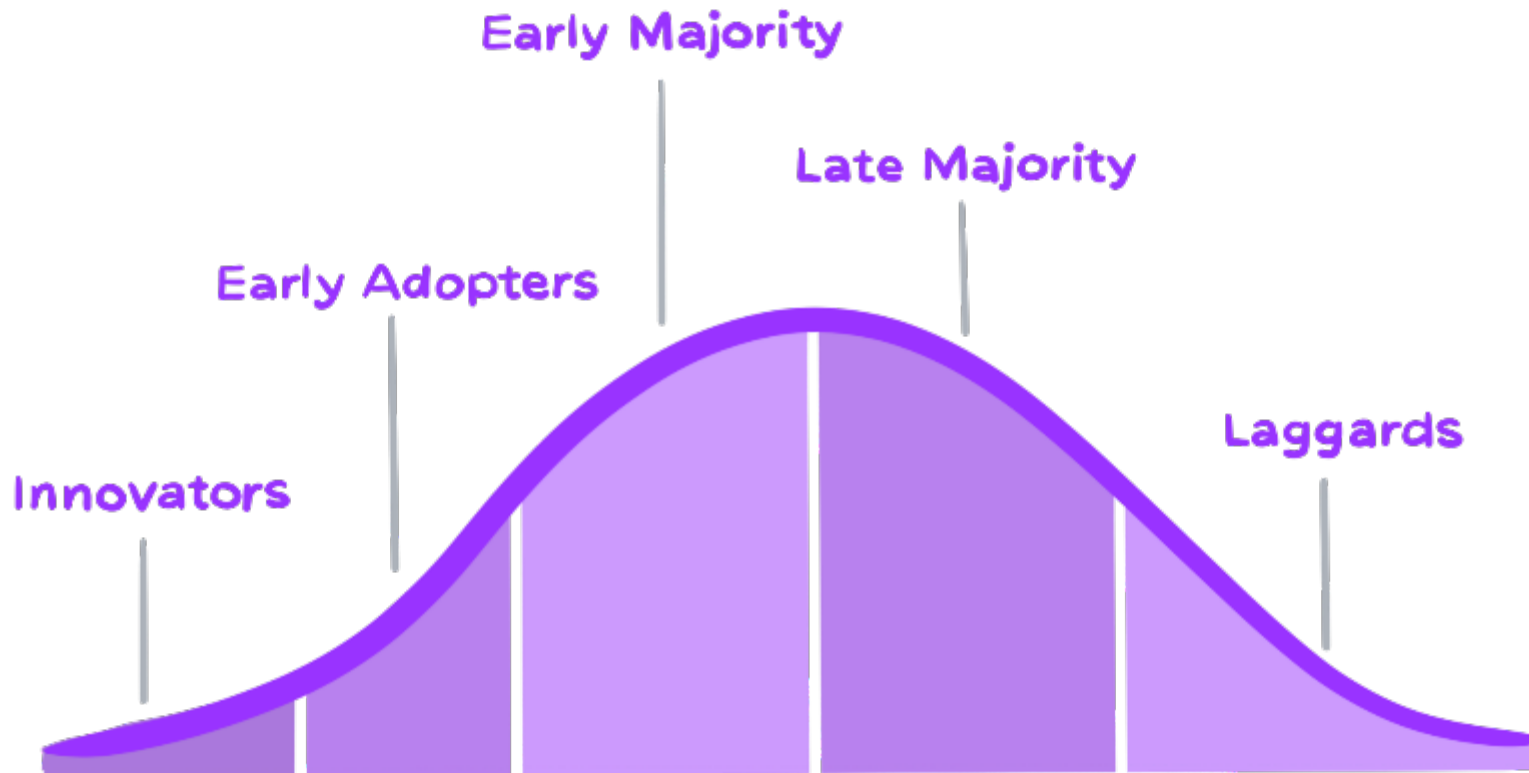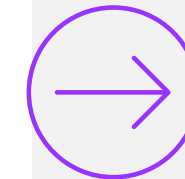# AI at CalSTRS: Current Practices and Our Immediate Horizon

Breakout Activity

Once more, where do you think CalSTRS should be on the innovation adoption curve for GenAI?

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→ Please use your phone or laptop to go to menti.com, enter the code and submit your response.

Early Majority

Late Majority

Early Adopters

Laggards

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Menti Results

Shareback & Discussion

Recap & Next Steps