

Generative AI & workforce development

NOVEMBER 2024

Topics

Defining Generative AI

Current state of GenAI

Use of GenAI at scale

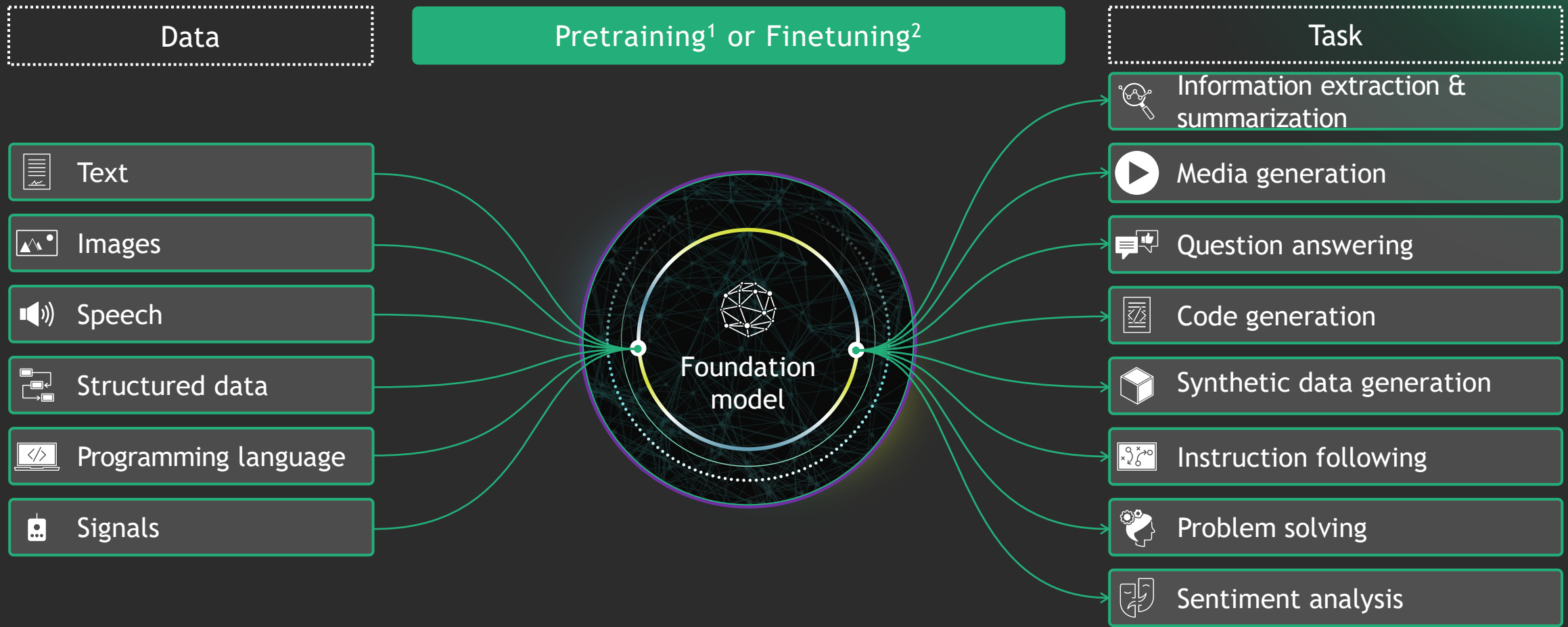
Risks & need for Responsible AI

What States are doing, including Arkansas

Implications for workforce development

What you can do with GenAI

Generative AI is a class of algorithms offering content generation and more



1. Several GB or TB of data required; Self-monitored: no annotated data 2. Little data required (100,000 examples); highly specialized data, reasoning will be trained by adapter

Back up | Concise dictionary of Generative AI

- **Generative AI** - algorithms capable of generating new content: text, images, media
- **Foundation model** - reusable model trained on lots of data that can be adapted for many tasks
- **LLM** - large language model, type of foundation model trained on text (And, GPTs are a type of LLM)
- **Prompt** - a query (text, image) input to the model
- **Pre-training and fine-tuning** - base model training and following adaptation to solve specific tasks
- **Multi-modal** - using data of multiple modalities: text, images, video
- **Model hallucination** - generating incorrect responses, nonsensical content, mistakes, making things up

Artificial Intelligence innovation has progressed in waves

Innovation of the past...

...leading to explosion in AI innovation today

Wave 1: Cybernetics (1950s-70s)

Field of AI research was founded and key **concepts were first described, including early neural networks**

Wave 2: Trained experts (1980s-90s)

Expert systems were developed to **solve problems about a specific domain of knowledge**

Wave 3: Good learners (2000s-2020s)

Progress in artificial neural networks, “deep” learning, CNNs, RNNs led to notable **achievements in text, speech, language and vision processing**

Wave 4: Generative systems (2020s →)

These systems can adapt contextually, **learn and function with minimal supervision, and massively augment human intelligence**

Generative AI provides impactful and practical use cases for organizations

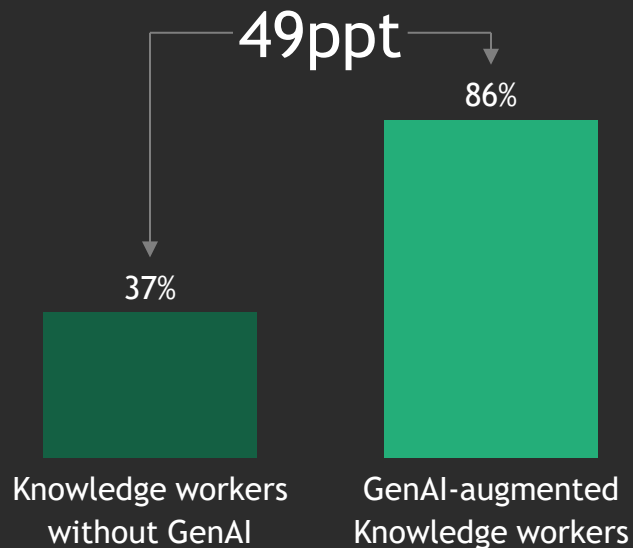
Illustrative

- 1 Forecasting and scenario building (e.g., visualization of key financial insights)
- 2 Ongoing monitoring and reporting (e.g., standardized report generation)
- 3 Performance management (e.g., consolidation of reviews and key takeaways)
- 4 Hiring and onboarding (e.g., synthesis of interview notes)
- 5 L&D training design (e.g., generate new and up to date training materials)
- 6 Candidate sourcing (e.g., automated screening and synthesis of candidate applications)
- 7 Contract management (e.g., draft contracts)
- 8 Document review (e.g., proofread contracts)
- 9 Development of strategy meetings & documents (e.g., draft reports)
- 10 Program Management (e.g., synthesis of meeting minutes and correspondence)
- 11 Management support / Chief of Staff (e.g., draft meeting agenda from correspondence)

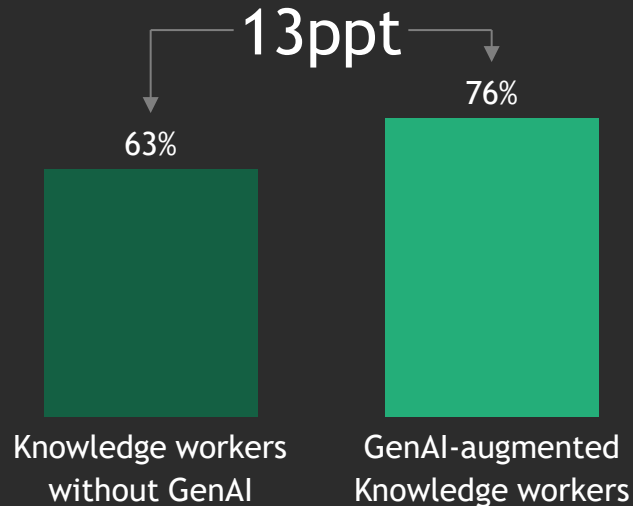
● Finance ● HR ● Legal ● Other

Example | GenAI immediately amplified generalist knowledge workers' data science skills

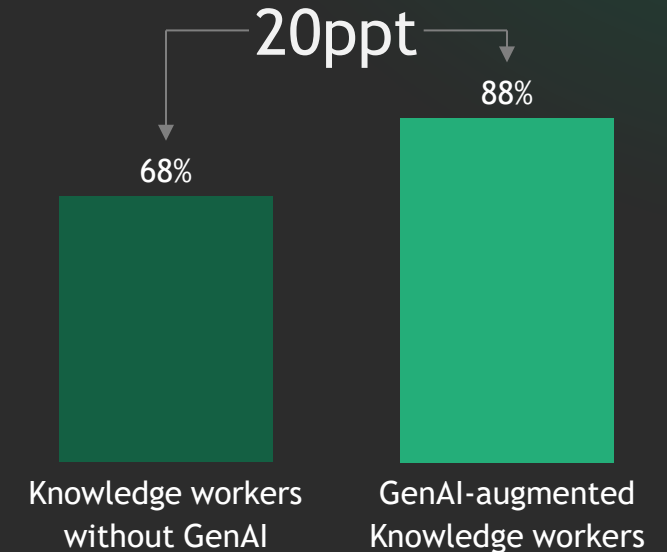
Achieved near-parity in coding for data cleaning



Improved application of ML to predictive analytics



Narrowed gap in statistical understanding

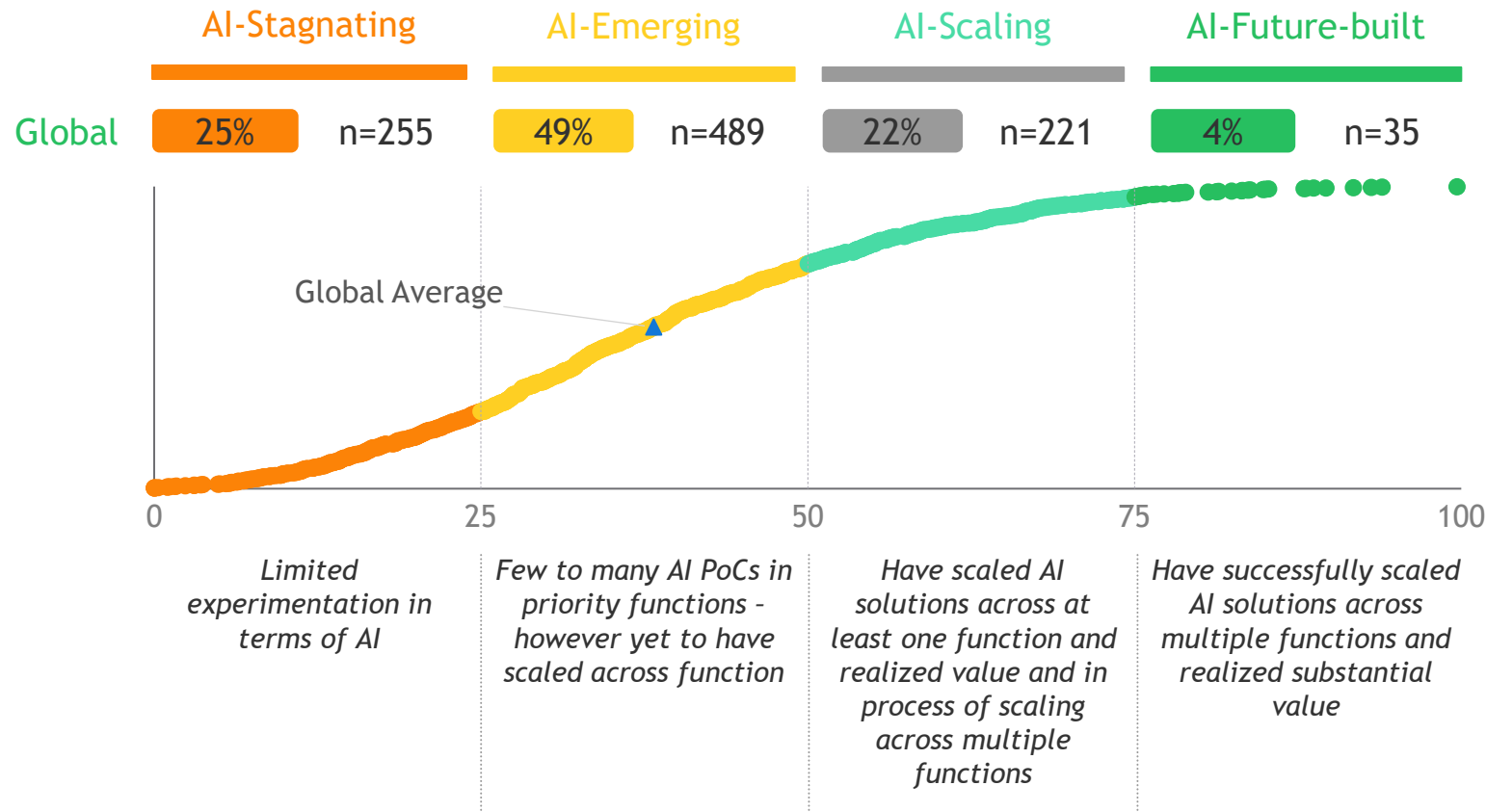


■ Knowledge workers without GenAI ■ GenAI-augmented Knowledge workers

Note: Average normalized performance of knowledge workers with and without access to GenAI for three data science tasks. All scores are normalized so that 100% is equivalent to the benchmark set by the average of the data scientist scores.
Source: Technical workforce capabilities experiment (March-June 2024); BCG Analysis

A few (but not most) companies have cracked the code on implementing AI at large scale...

...and are reaping the benefits



	Revenue	1.5x	more Revenue growth (3 yr avg)
	Innovation	1.9x	more Patents
	Employee satisfaction	1.4x	better overall Glassdoor indicator

Source: BCG Build for the Future 2024 Global Study (merged with DAI), n=1000

Implementing AI
at scale is not
only about
technology

10%

Algorithms

Generative AI models

20%

Technology / IT

Data platforms, data quality, & availability
Visualization tools

70%

People & processes

Ways of working & business process
design
Org design
Talent and skills
Change management & communication

Responsible AI | Critical to know and mitigate range of risks

Not exhaustive

Technology-inherent risks



Hallucinations

GenAI can produce factually incorrect responses in a convincing manner



Leaks of proprietary data

Companies & employees may transmit proprietary data when using GenAI tools



Biased outputs

Without oversight, the GenAI models trained on biased data also carry bias



Sophisticated phishing & fraud

GenAI makes cybercrime easier, generating convincing phishing emails or deepfakes

Watch-out areas



Copyright

GenAI is potentially trained on proprietary data



Liability

Liability for harm and damage caused by GenAI is unclear



Cybersecurity

GenAI may be restricted by cybersecurity policies



Energy and environmental

GenAI uses more energy for computing power

State actions | States are mobilizing resources across 4 common themes...



Policy & regulation

- Establishing state-level AI task forces and working groups
- Policies and guidelines for responsible AI use in public sector entities (agencies, K-12)
- Requiring developers of AI systems to protect consumers



Innovation and R&D

- Partnerships between higher ed and OpenAI, NVIDIA, others on responsible AI research
- Hubs to drive collaboration among industry, startups, and researchers
- Funding to explore use cases



Education and workforce enablement

- Equipping 2- and 4-yr institutions with AI resources, labs, and workshops
- Public-private partnerships to train students and workers and enhance AI skills



Government operations and service delivery

- Piloting GenAI tools in government operations

In Arkansas, the **AI and Analytics Center of Excellence** (AI CoE) is studying the technology and will recommend policies around its use

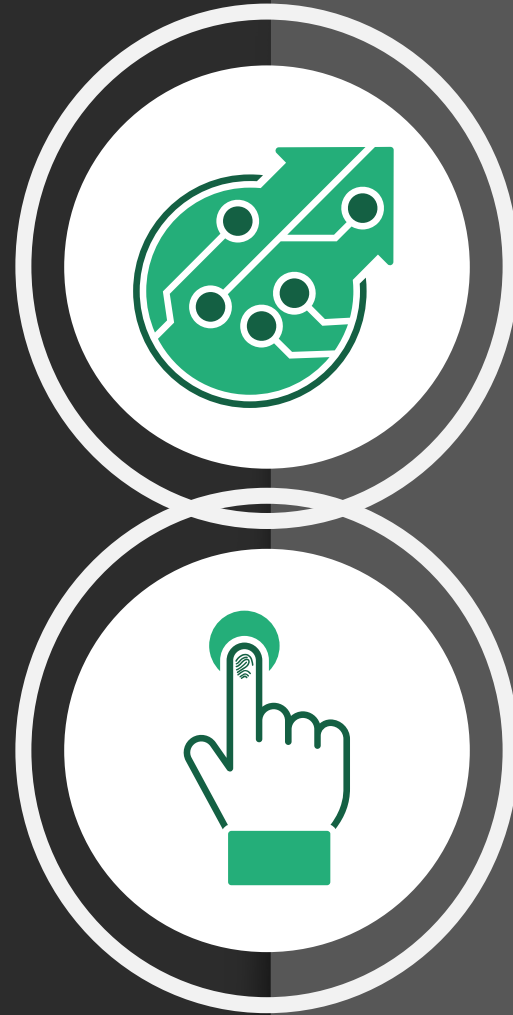
The AI CoE aims to deliver an initial report by **December 2024** with key insights and recommendations

In 2025, the focus will shift to developing **AI governance, guardrails, and best practices** with pilot programs

Planned pilots include using AI to address root causes of recidivism—emphasizing long-term employment—and to reduce unemployment insurance fraud

Additional efforts will provide **public AI literacy resources** and explore ways to **enhance citizen interactions** with government through AI

For workforce development partners there are **two conversations** about GenAI



What **GenAI** means for the workforce of the future

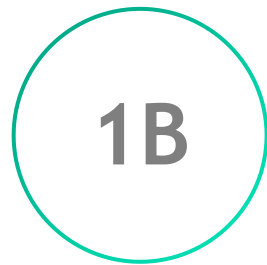
Ways **GenAI** may be used in the work of **workforce development**

Pace of change | Changes to cutting-edge skills are accelerating creating the need for large-scale capability building

Workforce skillsets are becoming increasingly outdated...



Half life of technical skills



Reconfigured jobs in the next 10 years due to AI

A trend that will accelerate as GenAI changes how we work



Of workers will have 10% of their tasks impacted



Of workers will have 50% of their work impacted

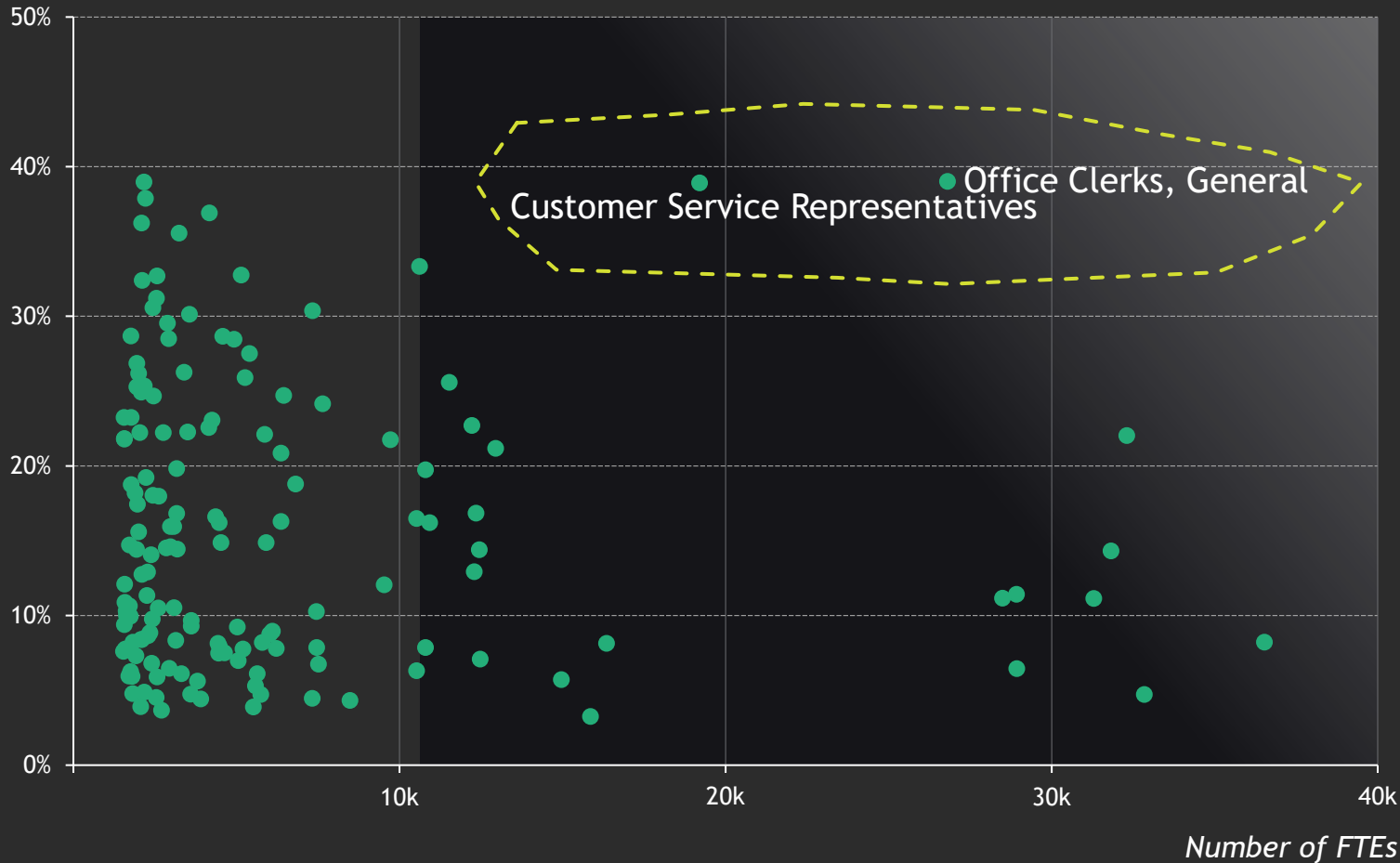


Reduction in time taken to complete writing tasks

Sources: World Economic Forum (Skill half-life); Emeritus; Gartner research; World Economic Forum; MIT Working Paper "Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence", 2023; University of Pennsylvania research paper, "GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models"; Gartner Emerging Tech: Primary Impact of Generative AI on Business Use Cases

We can start to predict which jobs will be most impacted. In **AR**, GenAI is expected to yield an avg. of **~15% time savings** across all roles

Estimated potential productivity gains (time savings)



Average pot.
Productivity gain
(time) across all
roles¹
15%

AR's labor force could experience a **15% productivity gain**, expressed as a reduction in total hours worked

FTE impacts would need to be analyzed at the company level. Actual company actions could vary

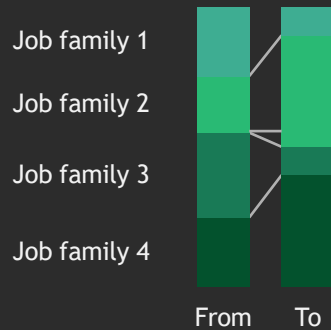
☆ Analysis based on 83% of total FTEs

1. Sum product of estimated time reduction and share of labor force
Source: BLS, O*NET, BCG Analysis

AI in Workforce Dev | AI can enable more personalized workforce development

1 Better matching talent and skills

Work redesign



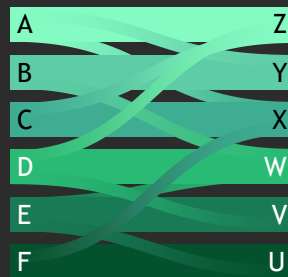
Job-skills matrix

Job Family	Skill	Level	Level	Level	Level
Job Family 1	Business & market knowledge	High	High	High	High
	Change management (people)	High	High	High	High
	Product management	High	High	High	High
	Application knowledge	High	High	High	High
	Customer sales & value creation	High	High	High	High
	Business & market knowledge	High	High	High	High
	Change management (people)	High	High	High	High
	Product management	High	High	High	High
	Application knowledge	High	High	High	High
	Customer sales & value creation	High	High	High	High

Skills mapping

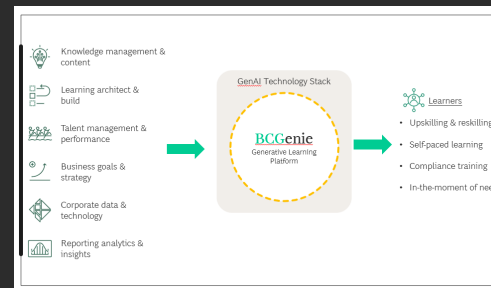


Job-matching



2 Training and upskilling our workforce

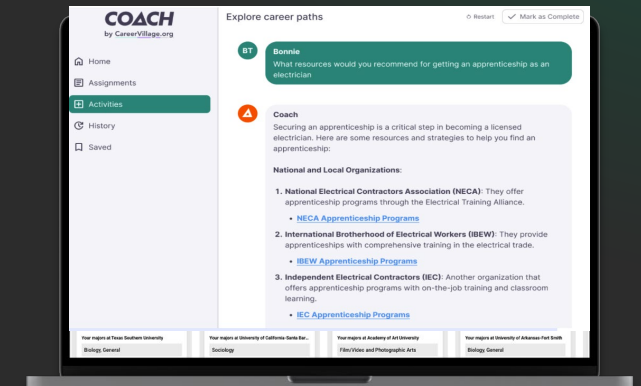
Generative Learning Platform



- Prompts a learning exercise to achieve custom objectives - **greatly reducing time spent in creating training content**
- Multi-modal resources are deployed based on learner preferences - **improving engagement**
- Platform is evaluated to continuously adapt learning to meet desired outcomes

3 Coaching and career navigation support

COACH by CareerVillage



- Provides **personalized career plans**, interview prep, career and college exploration, and resume/cover letter advice

Source: BCG analysis

Several **digital efforts** already underway in **workforce and adjacent areas** in Arkansas (which involve or may involve GenAI in the future)

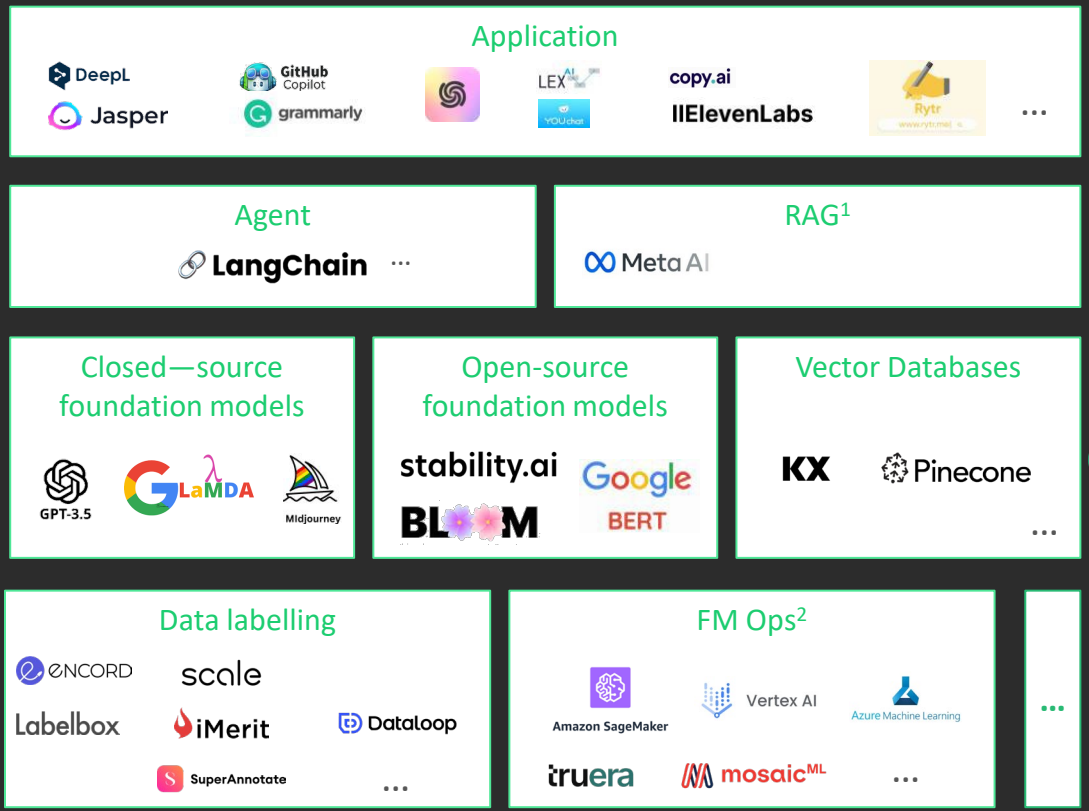
- The **LAUNCH platform**, part of the Arkansas Workforce Strategy, will soon be announced by the Governor
- An **integrated service delivery** system will offer a "no wrong door" approach to service discovery, intake, assessment, planning, and navigation, beginning with WIOA and UI
-
- A **government services portal** will provide residents personalized, digital access to services and data from any device
-
- AI will be used to **enhance data curation, quality, and governance**

What you can do with GenAI

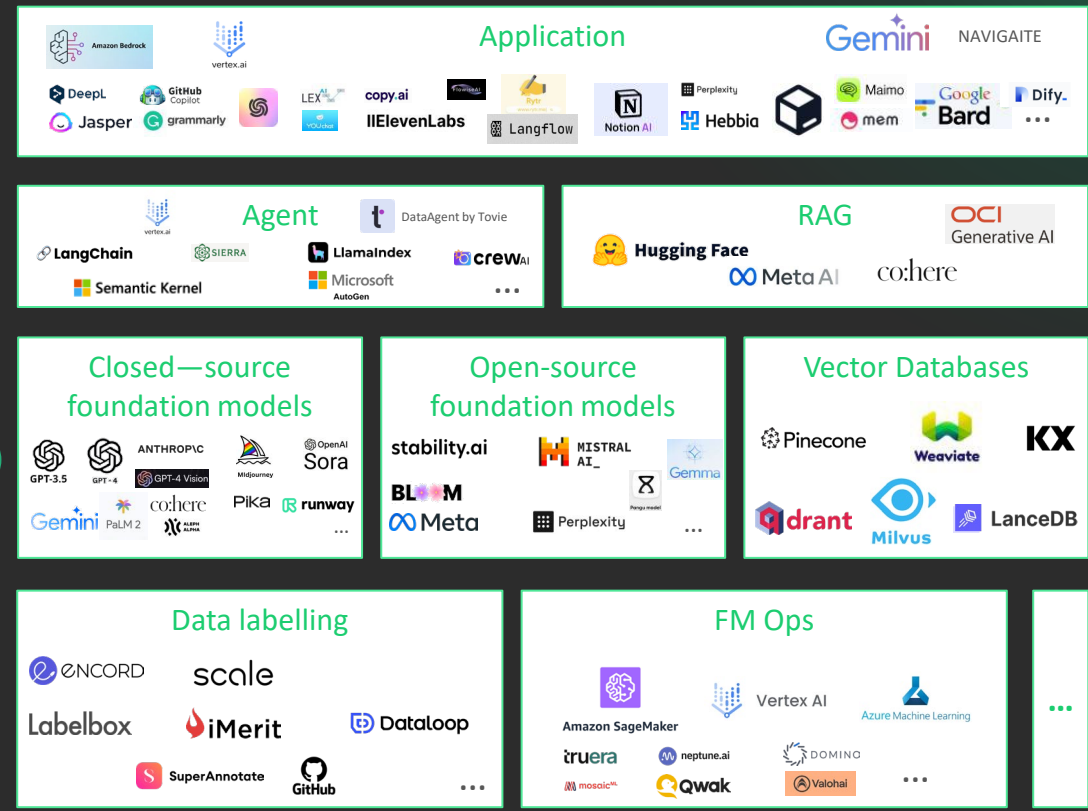
Many new players have entered the market for the last 12 months

Non-exhaustive

Vendor dynamics (Dec 2022)



Vendor dynamics (April 2024)



- Very few open-source models available in late 2022
- OpenAI was the dominating closed-source model provider
- Limited GenAI applications due to immature technologies

- # of vendors exploded, esp. open-source model
- The leaders largely remained consistent in each space
- Many start-ups (e.g., Mistral) are catching up

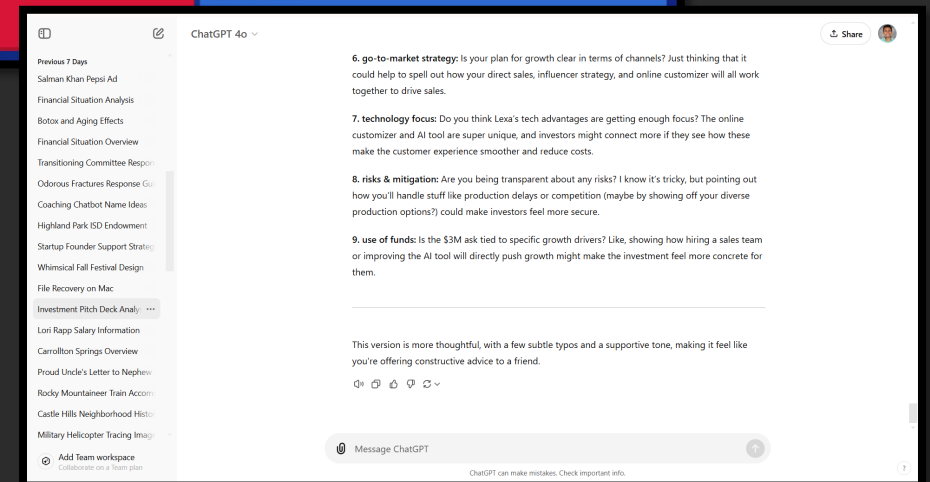
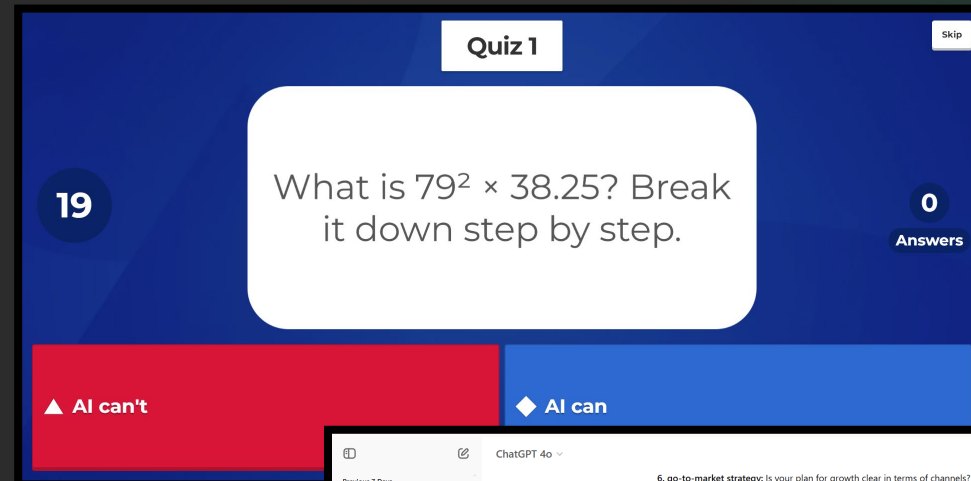
1. Retrieval Augmented Generation 2. Foundational Model Operations

Tomorrow | The Art of the (not yet) Possible!

7:30am – 8:15am | Athletic Club

With the right knowledge, skills and mindset, we can use AI to significantly drive productivity, unlock valuable time, and deliver business impact:

- How will AI tools reshape work?
- What can AI do and what are its limitations?
 - **Interactive game!**
- What are some use-cases and examples where I can see immediate benefit?
 - **Live ChatGPT experience**



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