



Technology & Leadership Center

JAMES MCKELVEY SCHOOL OF ENGINEERING AT WASHINGTON UNIVERSITY

December 8, 2023

Is Your Organization Ready for Artificial Intelligence?

Prof. Jeromey Farmer

Professor of Practice & Academic Director

Washington University in St. Louis

McKelvey School of Engineering



Professional Education at the McKelvey School of Engineering

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Key Offerings

- Customized corporate training
- Professional certificates
- Individual skill builders
- Industry credential preparation
- Bootcamps
- Roundtables



Jeromey Farmer

Professor of Practice & Academic Director

Washington University in St. Louis

McKelvey School of Engineering

Areas of Expertise

- Technology Strategy
- Enterprise Data Strategy
- Artificial Intelligence
- Digital Transformation
- IT Strategy
- Technology Change Strategy



Professional Background

Jeromey has over 20 years of experience in artificial intelligence, data science, product innovation, cloud, digital strategy, advanced analytics, research and critical analytical intelligence supporting senior management to drive development and execution of key strategic initiatives and business decisions. He is a proven academic leader in developing, launching, and growing academic programs in the data and technology space. Jeromey is a strategic and visionary leader dedicated to formulating and solving complex business problems to meet business and customer needs creating a sustainable model for success. Jeromey successfully led the Slalom in St. Louis that within four years achieved a \$150M revenue run rate with all years being profitable. He successfully created and executed a professional services consulting company, two new divisions in data science, innovation, and research leading to expanded responsibilities and growth of additional business lines to support for the US Treasury as part of the Federal Reserve, and a US-focused CPG company's data science organization focusing on new products to drive product innovation and renovation. Effectively partnered with senior executives and led data and business analytics teams to drive corporate cost savings, efficiency and performance gains, and sustainability campaigns. Successfully built, grew, and developed high performance teams and have assumed and excelled in increasing responsibilities through career.



Professional Experience

Academic Director and Professor of Practice

McKelvey School of Engineering, Washington University (Present)

Head of North America Data, AI, & Analytics Advisory

Avanade / Accenture (Present)

Executive Management, Technology and Data Strategy

Equifax, Edward Jones, Kynetec, Safety National (2020-2023)

Managing Director, Technology and Data Capabilities

Slalom (2016-2020)

Vice President and Officer, Head of Treasury Data Science and Analytics

Federal Reserve Bank (2013-2016)

Management Consultant, Global Data Science Leader

Nestle Purina (2006-2013)



Industries

- Financial Services
- Consumer goods
- Healthcare
- Lifesciences
- Professional Services
- Education



Education

- Ph.D. in Applied Mathematics
- MBA with emphasis in Supply Chain & Logistics
- MS in Information Systems
- BS in Computer Science
- BS in Mathematics



Today's Agenda

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Motivation for Today's Webinar on Artificial Intelligence (AI)

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Key Take-aways

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Open Q&A



By the end of today's webinar, you will have...

- **Increased Understanding of AI and Generative AI:** Enhanced understanding of what AI is, its fundamental concepts, and how it functions.
- **Awareness of AI's Applications:** Awareness of the wide-ranging applications of AI in various industries and real-world relevance of AI technology.
- **Recognition of AI Challenges and Considerations:** Awareness of the challenges and considerations associated with AI, including data, technology, culture, and others.
- **Understanding of Critical Components for Readiness:** Awareness and understanding of critical components, tools, and frameworks for AI readiness and maturity.
- **Ideas for Next Steps:** Have a clear understanding of key activities to build and activate a roadmap to implement AI.



Motivation for Today's Webinar on Artificial Intelligence (AI)



The world is changing

Industries are transforming rapidly

The drivers for economic growth are evolving

The world is more connected than ever



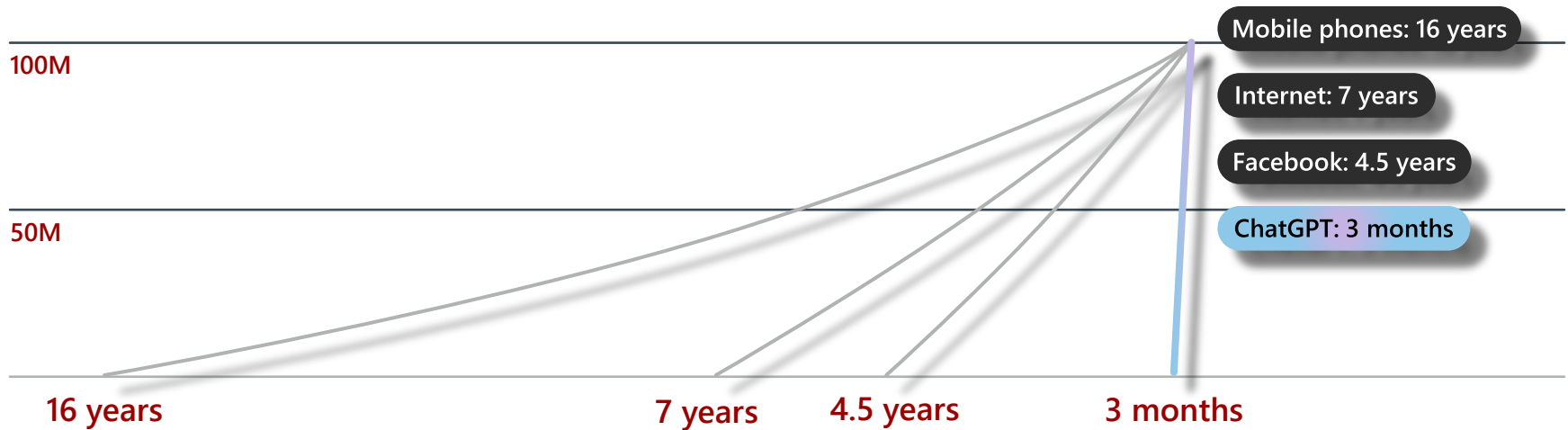
The AI technology is here

A collage of news headlines from various sources, all related to AI and Microsoft's Copilot. The headlines are arranged in a grid-like fashion with different background colors for each source.

- Forbes**: What ChatGPT And Generative AI Mean For Your Business?
- COMPUTERWORLD**: Microsoft's new Teams Premium tier integrates with OpenAI's GPT-3.5
- MARKETS INSIDER**: Nuance and Microsoft Announce the First Fully AI-Automated Clinical Documentation Application for Healthcare
- VentureBeat**: Microsoft gives Businesses a GPT boost In Teams and Viva Sales
- TheVerge**: ChatGPT is now available in Microsoft's Azure OpenAI service
- USA TODAY**: New Bing with ChatGPT brings the power of AI to Microsoft's signature search engine
- VentureBeat**: Microsoft announces generative AI-powered Copilot 365 to 'change work as we know it'
- CNN BUSINESS.**: Real estate agents say they can't imagine working without ChatGPT now
- TC TechCrunch**: Microsoft brings an AI-powered Copilot to its business app suite

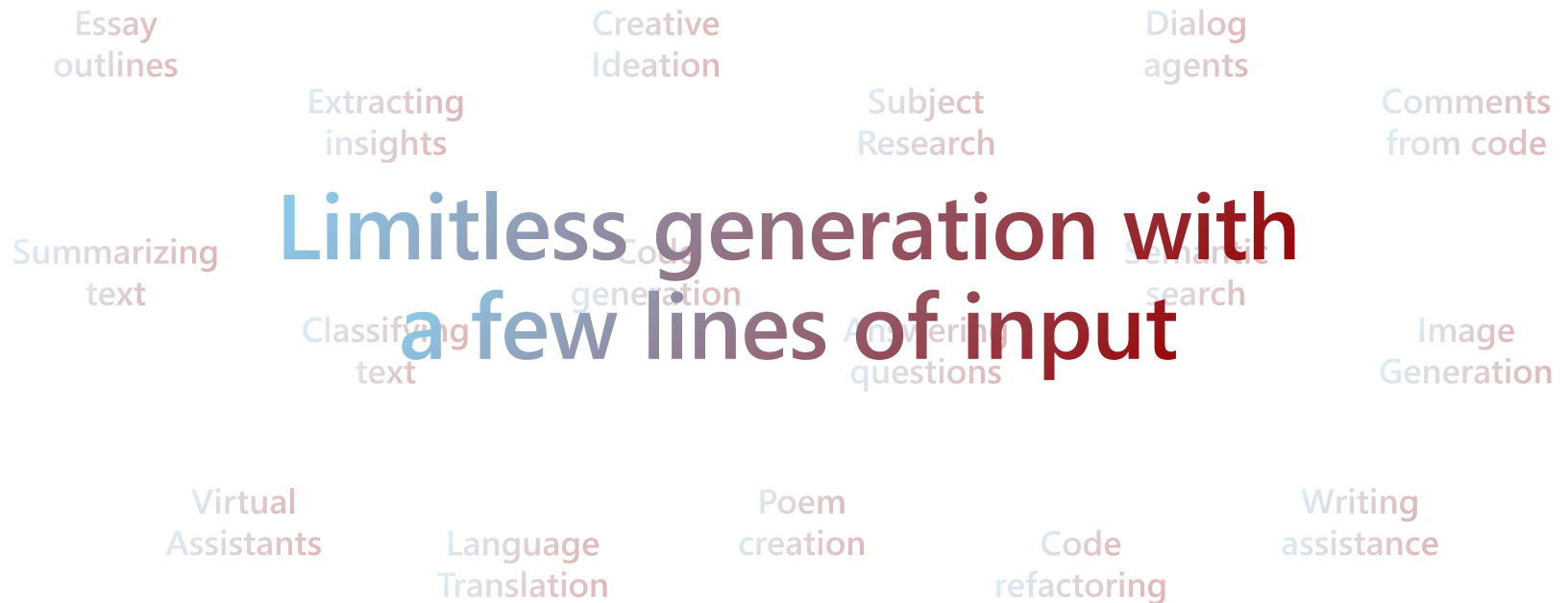


Time to Reach 100M Users





The Next Generation of AI Technology is Here





An AI Readiness Review

AI is transforming the way we work, collaborate and create.

But are organizations and their people ready to embrace an AI-first mindset and harness the full potential of AI?

<https://www.avanade.com/en/insights/generative-ai-readiness-report/organizational-ai-readiness>

1 Organizations and their people aren't fully ready for AI

Most employees (**95%**) are **optimistic** about AI and almost all (**96%**) are **confident** their organizations' IT professionals have the knowledge and resources to scale AI.

But less than half (**48%**) say their organizations have put in place a complete set of specific **guidelines/policies for responsible AI**.

2 Generative AI will disrupt how we work

Almost eight in ten (**79%**) employees anticipate that generative AI tools will **impact up to 20 hours** – half of their work week.

But the majority (**63%**) say they'll need some new skills or a completely **new set of skills** by the end of 2024 to seize AI's benefits.

3 AI-first is key to competitive advantage

Most (**92%**) believe they must **shift to an AI-first operating model** in the next 12 months to stay competitive, prompting the majority (**94%**) to increase their **digital investments** in 2024 to accelerate their AI journey.

To meet their organization's ambitious AI timelines, IT employees are **prioritizing their investments in data and analytics platforms** to unify their data and analytics under one digital roof to scale AI.



Market Context

The advances in foundation models are revolutionizing how & where enterprises can use generative AI

98%

of global executives agree AI foundation models will play an important role in their organizations' strategies in the next 3 to 5 years.

(Source: Accenture Tech Vision 2023)

97%

of global executives agree AI foundation models will enable connections across data types, revolutionizing where and how AI is used

(Source: Accenture Tech Vision 2023)

**6
in 10**

organizations plan to use ChatGPT for learning purposes and over half are planning pilot cases in 2023. Over 4 in 10 want to make a large investment.

(Source: CXO Pulse Survey, conducted by Accenture Research, February 2023)

**5
out of 22**

occupation groups will have Generative AI affect more than half of all hours worked

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

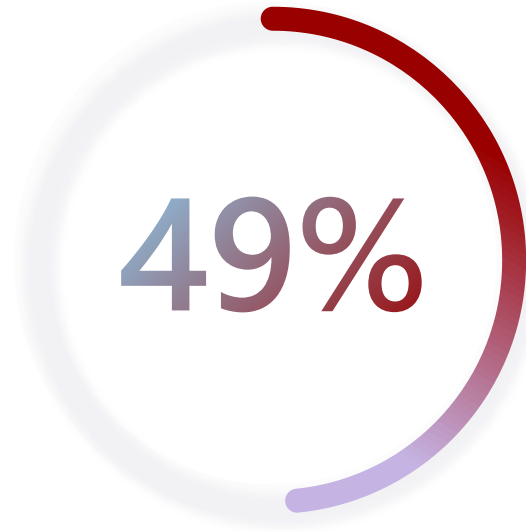
40%

of working hours across industries can be impacted by Large Language Models (LLMs)

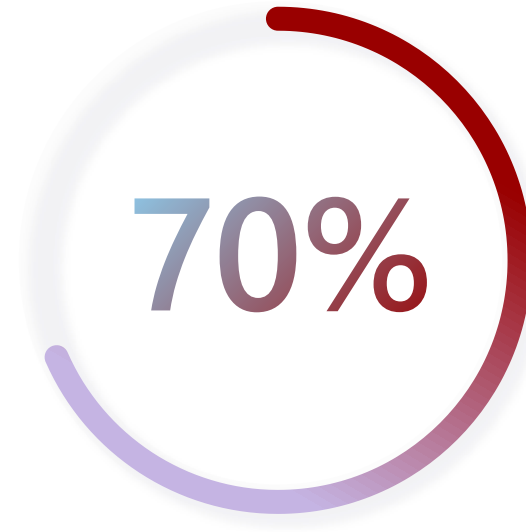
(Source: Accenture Research based on analysis of Occupational Information Network, US Dept. of Labor; US Bureau of Labor Statistics.)



There's a new AI-employee alliance



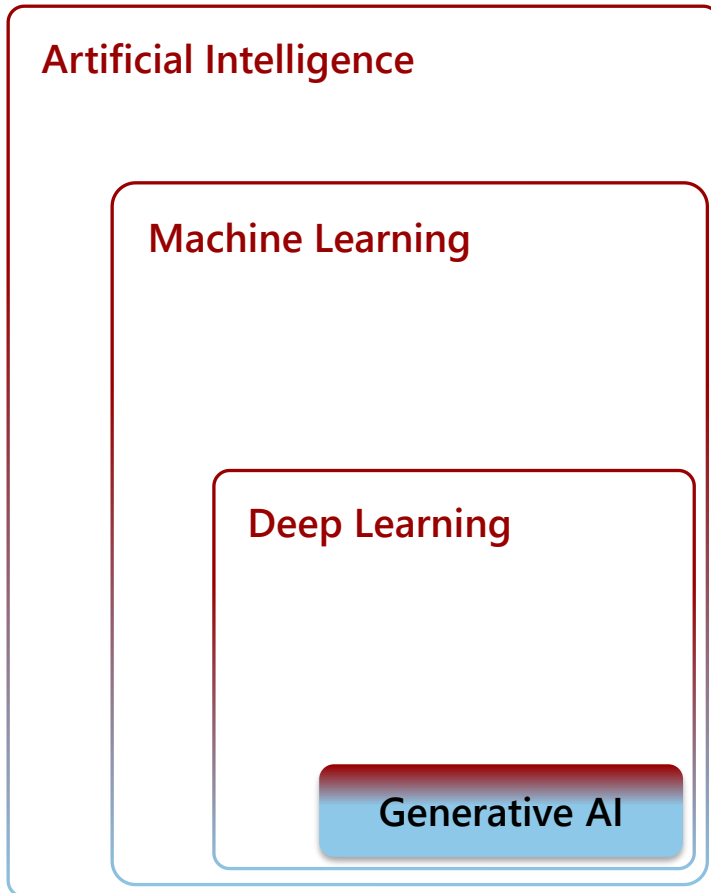
**of people say they're worried
AI will replace their jobs**



**would delegate as much work
as possible to AI to lessen
their workloads**



What is AI / Generative AI & How We Got Here



1950s Artificial Intelligence
the field of computer science that seeks to create intelligent machines that can replicate or exceed human intelligence

1990s Machine Learning
subset of AI that enables machines to learn from existing data and improve upon that data to make decisions or predictions

2010s Deep Learning
a machine learning technique in which layers of neural networks are used to process data and make decisions

2020s Generative AI
Create new written, visual, and auditory content given prompts or existing data.



What is Generative AI?

Generative AI consists of trained Large Language Models (LLMs) that generate responses specific to natural language questions

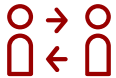
Popular Example of Generative AI: ChatGPT



LLMs are AI models that perform **natural language processing tasks**, such as language generation, text classification, translation, summarization, and question-answering

AI bot ChatGPT stuns academics with essay-writing skills and usability

Latest chatbot from Elon Musk-founded OpenAI can identify incorrect premises and refuse to answer inappropriate requests



Trained on **massive amounts of literature** to learn and understand the patterns and relationships between words and sentences and their meaning in context

Meet ChatGPT, the scarily intelligent robot who can do your job better than you

OpenAI's chatbot proves the gap between computers and humans is rapidly narrowing

LLMs use a process called inference to process input text / speech and generate **de novo replies** based on their learned patterns

Science & technology | Artificial intelligence

A new AI language model generates poetry and prose

GPT-3 can be eerily human-like—for better and for worse



Scaling AI and Generative AI across the entire enterprise is **mission critical**

84%

of global executives say they **must scale AI** to achieve their growth objectives.

98%

of global executives **agree AI foundation models and Generative AI** will play an important role in their organizations' strategies in the next 3 to 5 years.



but

76%

acknowledge they know how to pilot, but **struggle to scale AI** across the business.

75%

agree that if they don't scale AI in the next five years, they **risk going out of business.**

Source: ai investments, [A new era of generative AI for everyone](#)



Generative AI is growing exponentially

50 B\$+

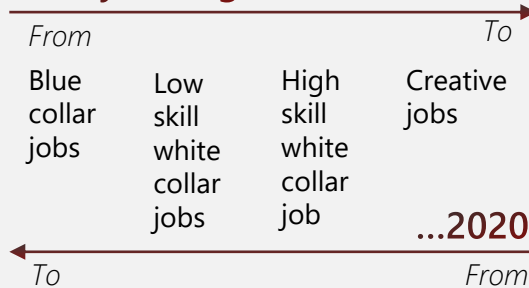
Pumped into **Generative A.I.** since 2022 (15 times more than the market investments in previous 5 ys combined¹)

> 450

start-ups are now working on **Generative A.I.**

Where **A.I.** is going to have an **impact**

Ten years ago...



10%

of all **data** could be **A.I. generated** in just **3 ys²**
(source: S.Nadella)



Text

...summarize and translate existing texts and generate new vertical specific content with good accuracy



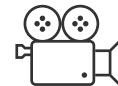
Images

...generate digital images (art, logos, photography) from natural language descriptions



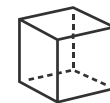
Audio

...generate audio from text/video, human-like voice and music (providing genre, artist, and lyrics as input)



Video

...turn text in basic video in a few minutes with no production needed and easily re-editable



3D

...generate first attempt of 3D models given a text prompt and directly usable within other 3D applications



Code

...generate line of code in different languages and debug with good accuracy

1. Source: PitchBook, data calculated across 78 deals
2. Source: S.Nadella



Generative AI Landscape

ChatGPT is one example. There are numerous capabilities in market today

Majors	Area of Focus	Key Announcements
Microsoft	ChatGPT with Search	<ul style="list-style-type: none"> Microsoft reveals new Bing with ChatGPT built-in, merging LLM with search
Google	Visual concept design generator	<ul style="list-style-type: none"> Google demos two new text-to-video AI systems, focusing on quality and length Google announces new AI-based text-to-video generator called Imagen is here
	Related Content Search	<ul style="list-style-type: none"> Google introduced multi-search- search using combination of images and text simultaneously Making search more realistic. Google Maps is expanding its 3D and immersive capabilities so people can get a feel for a place before they even go Google rolled out 'helpful content' algorithm update which rewards people-first content and devalues content written for search engine
	Visual concept design generator	<ul style="list-style-type: none"> In the shopping space, Google has introduced an advanced 3D shopping capability by making it easier for merchants to show their products in 3D using just a handful of photos instead of hundreds
OpenAI	Visual concept design generator	<ul style="list-style-type: none"> Open AI GPT-3 technique return a text completion in natural language by giving any text prompt like a phrase or a sentence, and produce visuals based on the descriptions
NVIDIA	Visual concept design generator	<ul style="list-style-type: none"> GauGAN2- Created by NVIDIA researchers allows anyone to create stunning landscapes using generative adversarial networks by turning any combination of words and drawings into a lifelike image NVIDIA GET3D generates 3D shapes with high-fidelity textures and complex geometric details
Apple	Related image generator	<ul style="list-style-type: none"> Apple has won a patent for the creation of Deepfakes that alter the facial expression and pose of a person in a photo or video
	Tagging, captioning & metadata	<ul style="list-style-type: none"> Apple adds live captions to iPhone and Mac, plus more accessibility upgrades to come
Meta	Visual concept design generator	<ul style="list-style-type: none"> Facebook parent Meta unveils AI video generator Make-a-Video

Minors

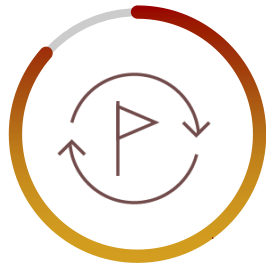
	Editorial automation & personalization
	CRM response tool
	Text-based content updates
	Article summarization
	Headline generation
	Verbal design
	Related Content Search



Top Challenges Implementing AI



Executives see AI as a growth driver, yet many are flagging a need for defining AI strategy, roadmap and governance



85%

Expect AI to increase revenue growth in the next 18-24 months, with the majority anticipating AI to be responsible for 6-16% growth in global annual revenue



36%

Are confident their organization has sufficient checks and balances in place to mitigate potential risks and harms of AI



73%

Agree "Safer and more responsible AI practices across the board" is among their overall top priorities for the next 12-18 months



The State of AI in the Enterprise Today



Data Foundation for AI Still Maturing

Most organizations are in their journey to **build a data platform / mesh as a single source of enterprise data** but lack the necessary governance, flexibility, or agility required for AI lifecycle



Many Proof of Concepts, Little Ops

Technical proof of concepts for specific use cases using ML techniques and Generative AI models happen but many **don't get into mainstream business operations**



Limited to Data Science & Advanced Analytics

AI is largely restricted to data science community engaged in advanced analytics for episodic business asks and decision making



Siloed And Uncoordinated Functions

Different initiatives (e.g., MLOps) are occurring w/ multiple standards driven by different organizations. **No common platform or standards** integrating these functions across the enterprise for AI development



Governance is An Afterthought

While **standards for data governance, quality management are being put in place**, **AI governance standards are not well understood** or nascent



Confusing Technology Ecosystem

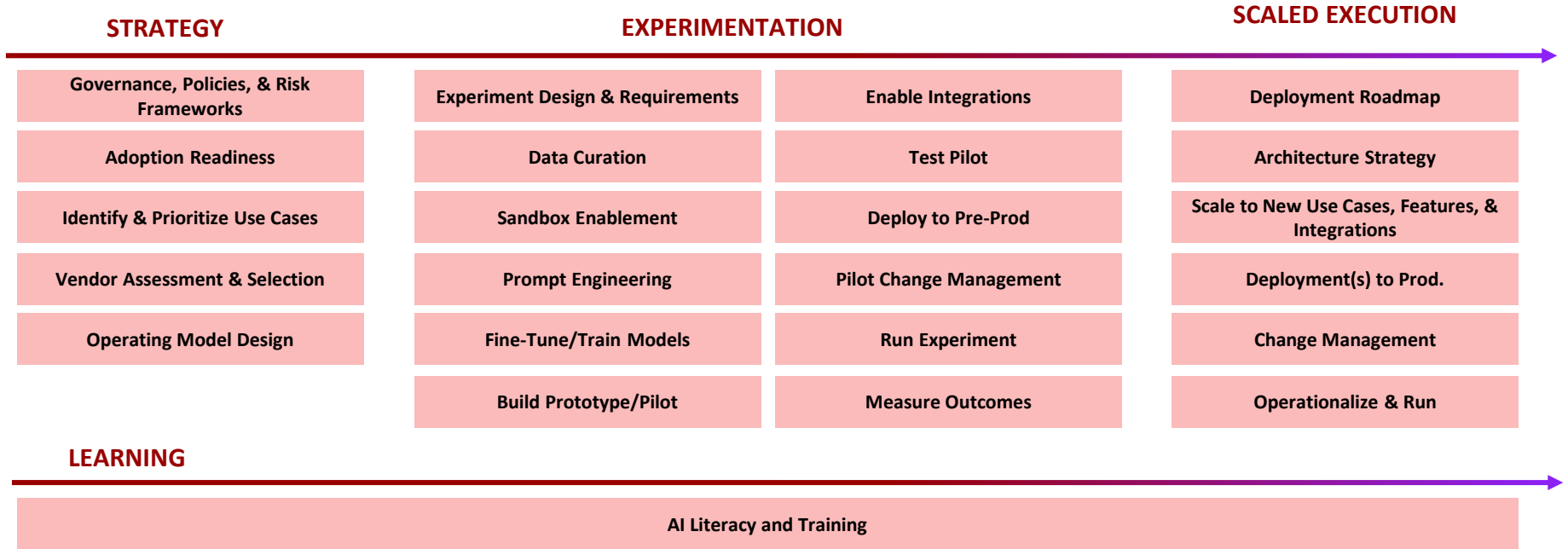
The ecosystem is highly active with **overlapping technologies and tools from major cloud providers, analytics vendors, niche players** as well as emerging AI platform players. Right choices required for enterprise scale and scope.



Roadmap to Implementing AI

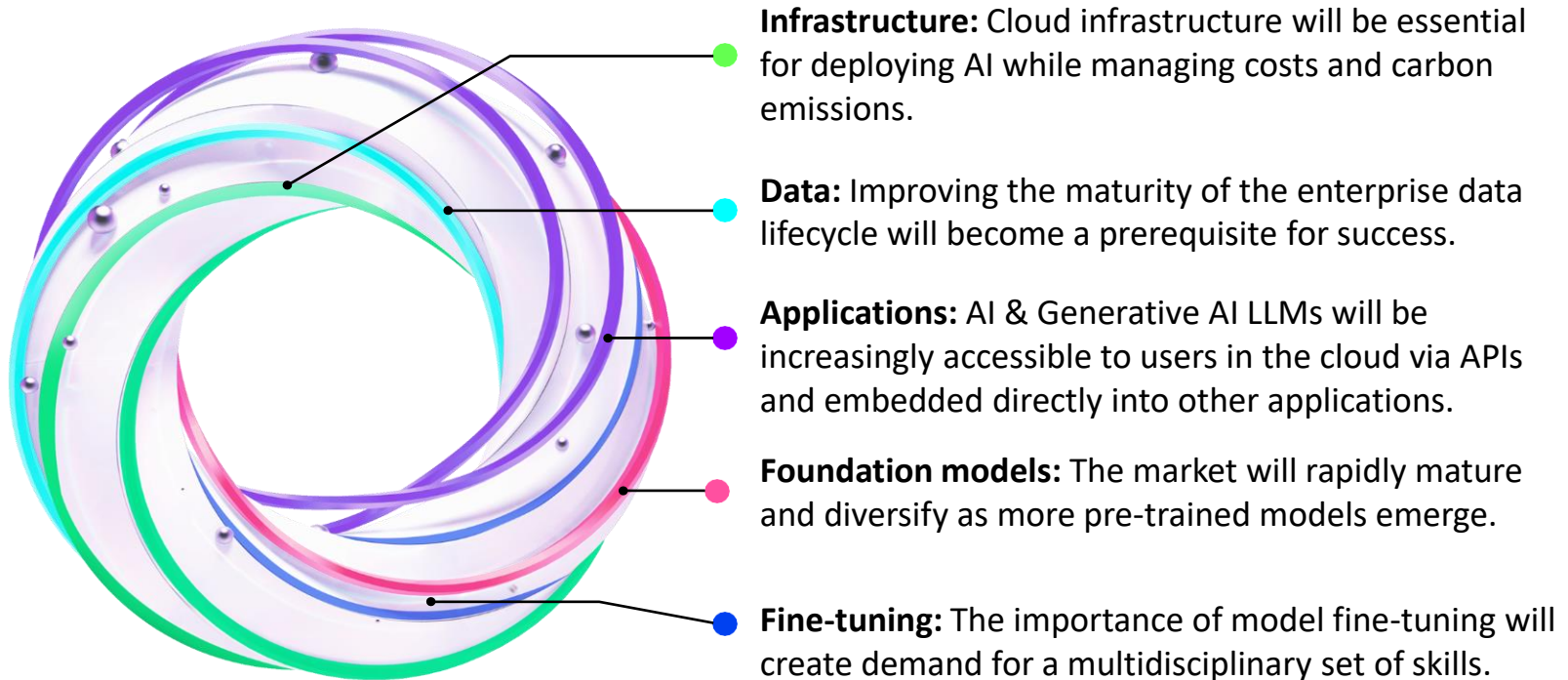


A Framework for Your AI Journey



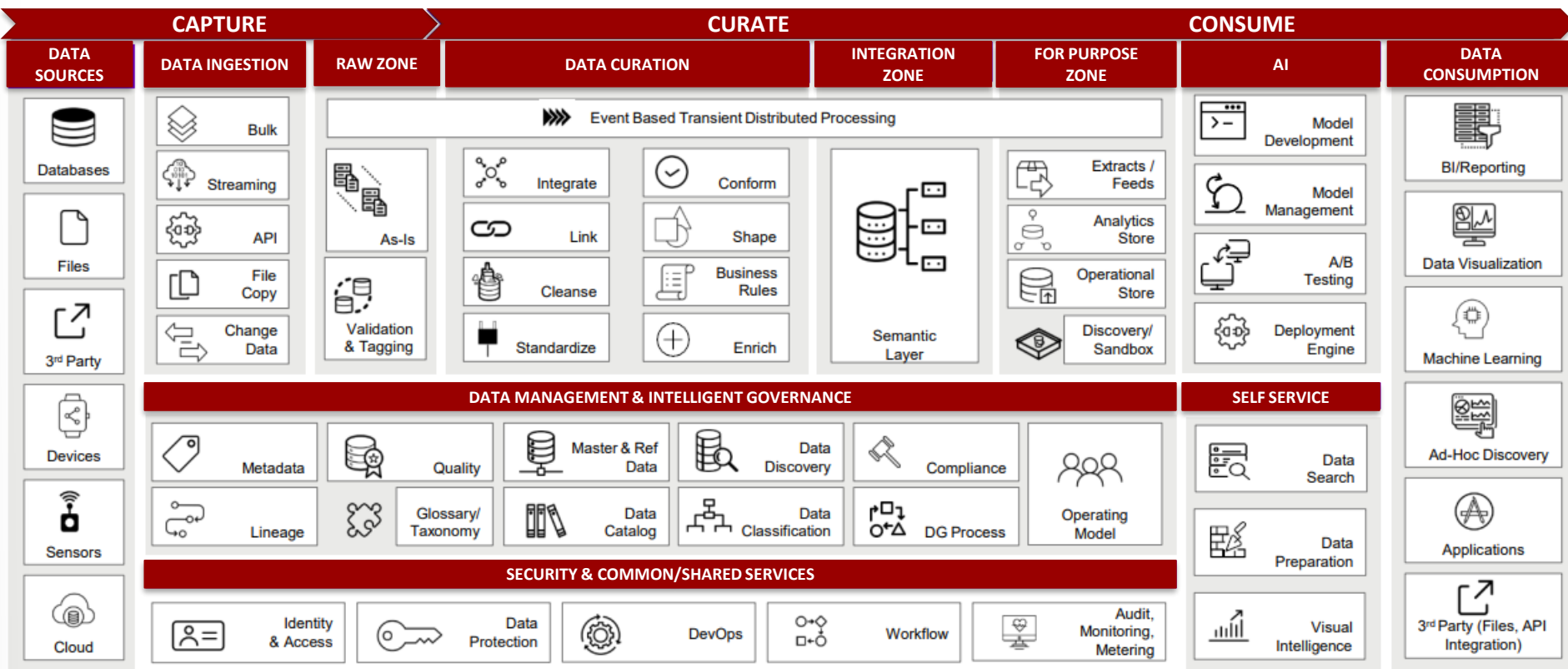


Foundational Infrastructure to Realize Value with AI





Illustrative Reference Data Infrastructure for AI



<https://www.accenture.com/us-en/cloud/services/infrastructure-index>



AI Readiness & Maturity



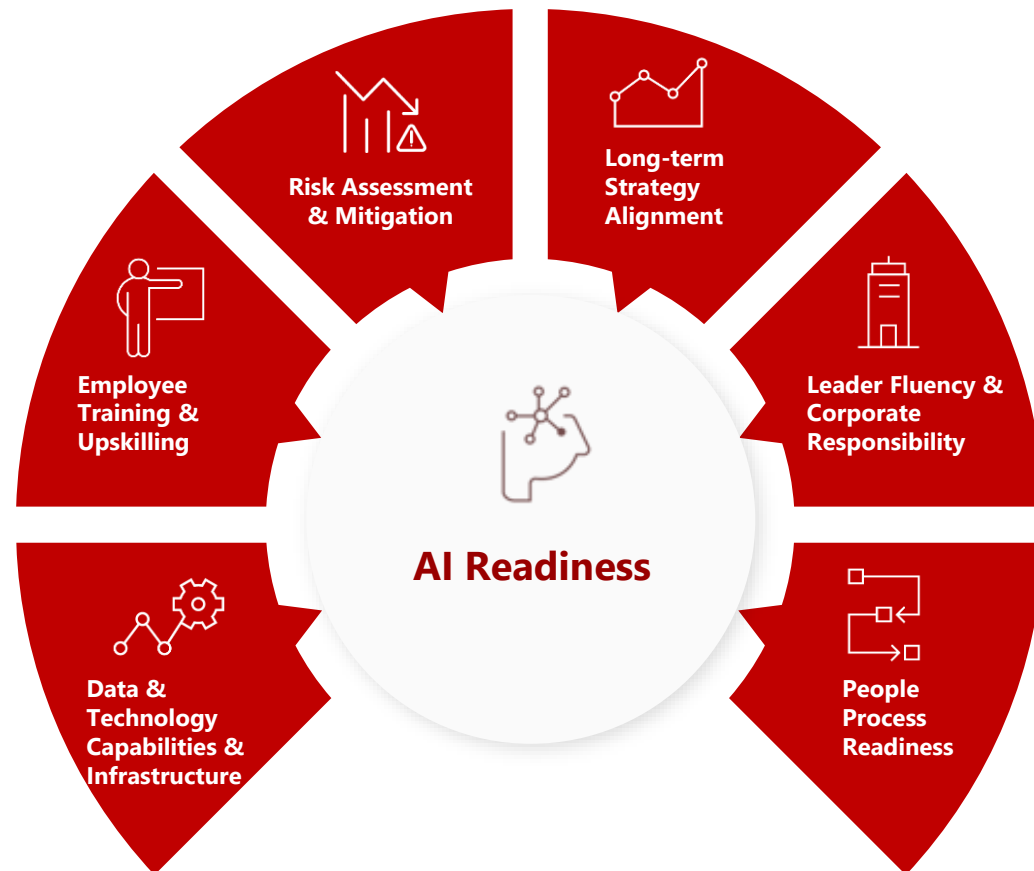
To become and remain an AI-first organization requires a multidisciplinary approach, spanning both business and IT dimensions.

Key principles.

Every organization is at a different point in their own AI maturity.

Consider readiness from a comprehensive lens across tactical and strategic aspects.

Look at your organization's priorities through the technical lens, while prioritizing and building the business case for adopting an AI-first mindset.





Responsible AI & Governance



The Shifting AI Landscape Requires Building a Responsible AI Foundation

Responsible AI is the practice of designing, building, and deploying AI in accordance with clear principles to **empower businesses, respect people, and benefit society** – allowing companies to **engender trust** in AI and to scale AI with confidence.



Responsible AI encompasses more than just fairness and bias

Responsible AI

The dimensions of Responsible AI are interconnected.

They require broad business and technical capabilities across dimensions





Building and maintaining trust



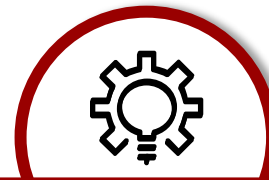
Principles & Governance

- Define & articulate a Responsible AI mission and principles (supported by the C-suite)
- Establish a clear governance structure across the organisation that builds confidence and trust in AI technologies



Risk, Policy & Control

- Develop policies and risk assessment(s) driven by ethical principles and current laws
- Operationalize policies through a risk management framework
- Develop regular reporting and monitoring



Technology & Enablers

- Develop tools & techniques to support ethical principles (i.e. fairness, explainability, etc.)
- Build these tools and techniques into AI systems and platforms
- Embed appropriate data governance and management



Culture & Training

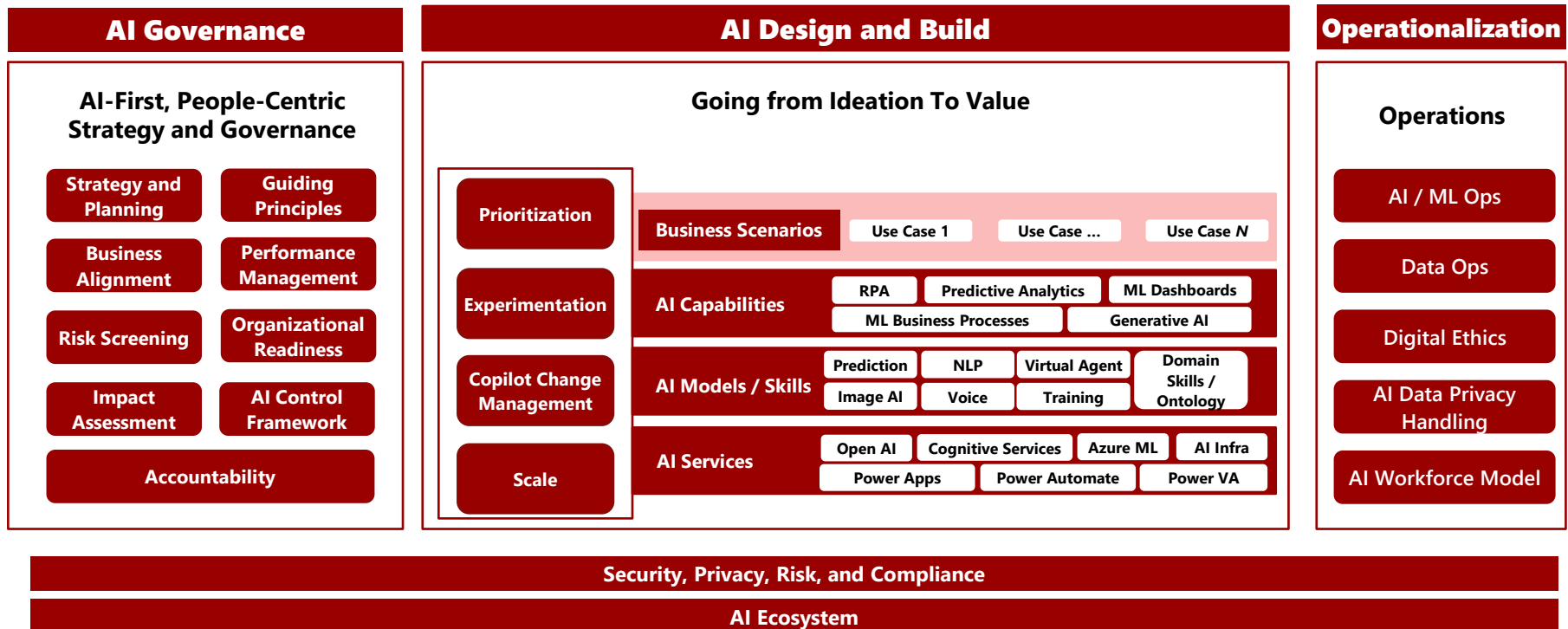
- Empower leadership to elevate Responsible AI as a critical business imperative
- Provide training to all employees, establishing a clear, universal understanding of Responsible AI principles
- Provide specialist training on tools, techniques, principles and actions



AI Operating Model & Framework to Begin

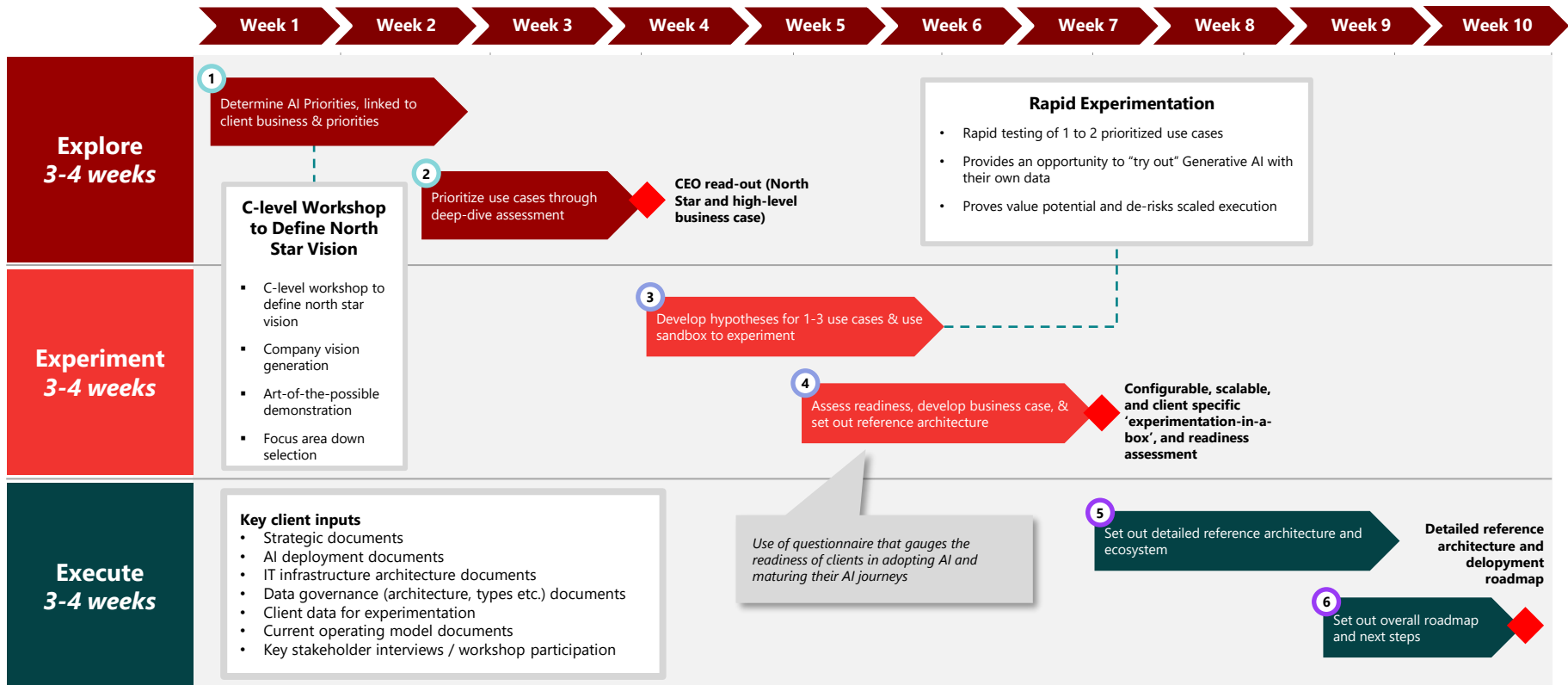


Key Considerations for your Target AI Operating Model





Framework to Begin





Key Take-aways



Get AI Right From the Start

1 Tap into the power of underlying AI technology

How: The time is **now**. Start simple and select use cases where these AI capabilities can be integrated in a **modular and scalable** way to address an opportunity/problem. This calls for a **profound rethink** of how the organization works, with multiple implications for enterprise IT architecture, organization, culture, and more.

2 Prepare for Change and Reinvent Work

How: AI is a productive assistant to help people, not replace them. Factor for **change enablement** to help users work iteratively from generated concepts. Companies must **reinvent work** to find a path to **AI value**. Business leaders must **lead the change**, starting now, in job redesign, task redesign and reskilling people.

3 Establish Governance and Responsible AI

How: Consider a **centralized** function to ‘think-big’, investigate, validate, refine and channel AI across your business. There needs to be a **balance** between **ambition** and robust approach of **transparency** and **communication** with customers, partners and employees on **risks, limitations** and **uncertainties**. Human subject matter experts should be identified to provide feedback for responsible, rapid, iterative retraining of the model.



Professional Education - Non-Degree

Public Training Classes & Custom Programs – In-person & Virtual options

- Agile Project Management/Risk Management,
- Cybersecurity
- Data
- ITIL
- Operational Excellence
- Leadership Development

Boot Camps

- Coding
- Cybersecurity
- Data Analytics, Data Science, Data Engineering

Roundtables

- Cybersecurity
- Project Management
- Data Analytics



Data offerings



FOUNDATIONAL

- Data Analytics Boot Camp



INTERMEDIATE

- Data Science Boot Camp



ADVANCED

- Data Engineering Boot Camp



EXPERT

- **AI/Machine Learning Boot Camp**
(Coming Soon)

Workshop for individuals:

**AI Readiness & Maturity Blueprint –
Mapping Your Maturity Journey**

Workshop for cohorts:

**AI Navigator:
Accelerate Your AI Readiness and Strategy Roadmap**



Upcoming Workshops

AI Readiness & Maturity Blueprint – Mapping Your Maturity Journey

A one-day multi-industry workshop: to 1) train participants on the readiness frameworks needed to understand their organization's posture regarding use of AI within the enterprise in terms of technology, data, talent, and governance and 2) map the steps required to progress on AI readiness through the development of a high level strategic roadmap.



Upcoming Workshops

AI Navigator: Accelerate Your AI Readiness and Strategy Roadmap

A two-day company specific workshop to equip executives and business leaders with the essential tools and knowledge to seamlessly integrate artificial intelligence into their organizational business strategy. Participants will learn how to assess their current AI readiness, identify growth opportunities, and develop a robust, future-proof AI strategy roadmap to AI enable their enterprises.



Open Q&A



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Thank you!



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