



Executive
Perspectives

06

The Future of the AI-Driven Tech and People Stack

Data and Digital Platforms

November 2024

Introduction

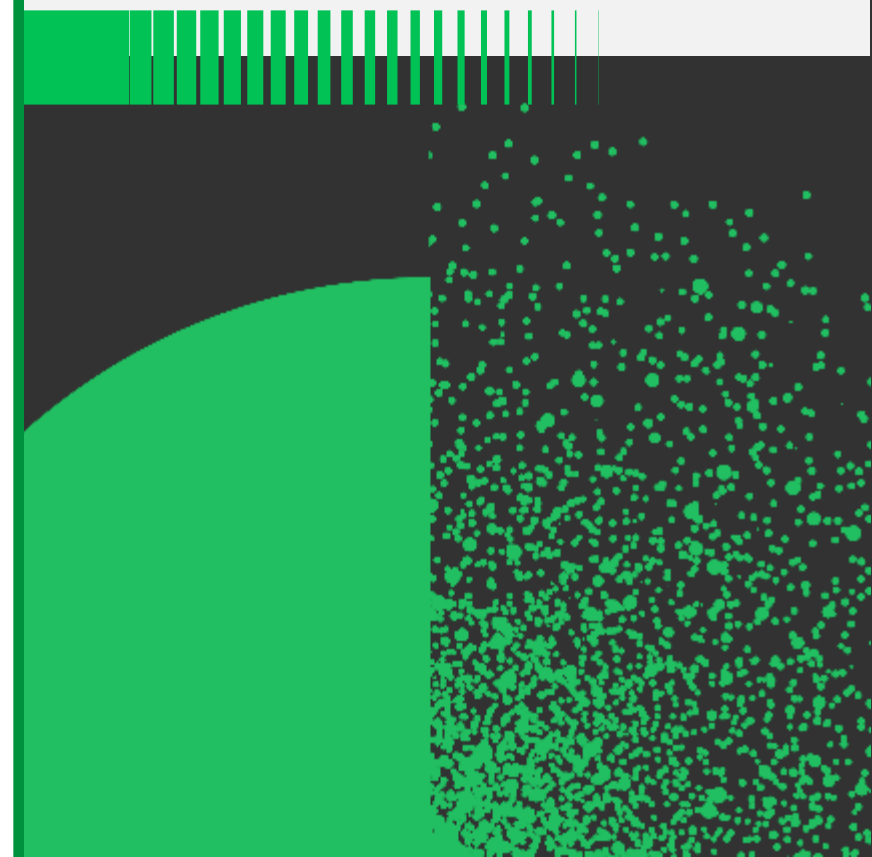
We meet often with CEOs to discuss AI—a topic that is both captivating and rapidly changing. After working with over 1,000 clients in the past year, we are **sharing our most recent learning in a new series designed to help CEOs navigate AI**. With AI at an inflection point, the focus in 2024 is on turning AI's potential into real profit.

In this edition, we discuss the future of data and digital platforms as well as the role AI will play in fundamentally transforming the tech function and wider organization. We address key questions on the minds of leaders:

- How do I set up my organization to maximize value from data and enable AI capabilities at scale?
- How do I evolve my tech stack and AI platforms to support building AI applications?
- How can I build an organization that is fast and composable?
- How do I get started...and how do I get this right?

This document is a guide for CEOs and technology leaders to cut through the hype around the future of the AI-driven tech and people stack and understand what creates value now and in the future.

In this BCG Executive Perspective, we articulate the vision and value of the future of the AI-driven tech and people stack



Executive summary | Data and digital platforms—new technology, ways of working, and skills required to succeed in the AI Age

Evolving the stack is key to unlock AI value...

AI spending will continue to increase rapidly, with a CAGR of ~30% in the next 3 years. **To unlock value, organizations are building new AI platforms, improving data capabilities, and rewiring processes** (e.g., 20% marketing savings via GenAI automation, 25% lower drug discovery time via GenAI)

... through a horizontal stack and organization

For effective and responsible AI development and scaling, **a so-called “horizontal stack” with a dedicated AI layer is essential**. This typically requires updates to existing layers to integrate with LLM models

A platform-based operating model, while not specific to AI, is instrumental in maximizing value from a horizontal stack. It fosters improved cross-functional collaboration and integration

Rewiring your architecture and IT operational setup is critical for success

Success hinges on robust tech capabilities, including establishing model selection frameworks, centralizing platforms, implementing data orchestration, and setting up evaluation methods

Complementing these technical capabilities are key operating model drivers, revolving around AI roles and governance, planning AI talent, and championing AI leadership and culture



Key questions you should be asking your CTO

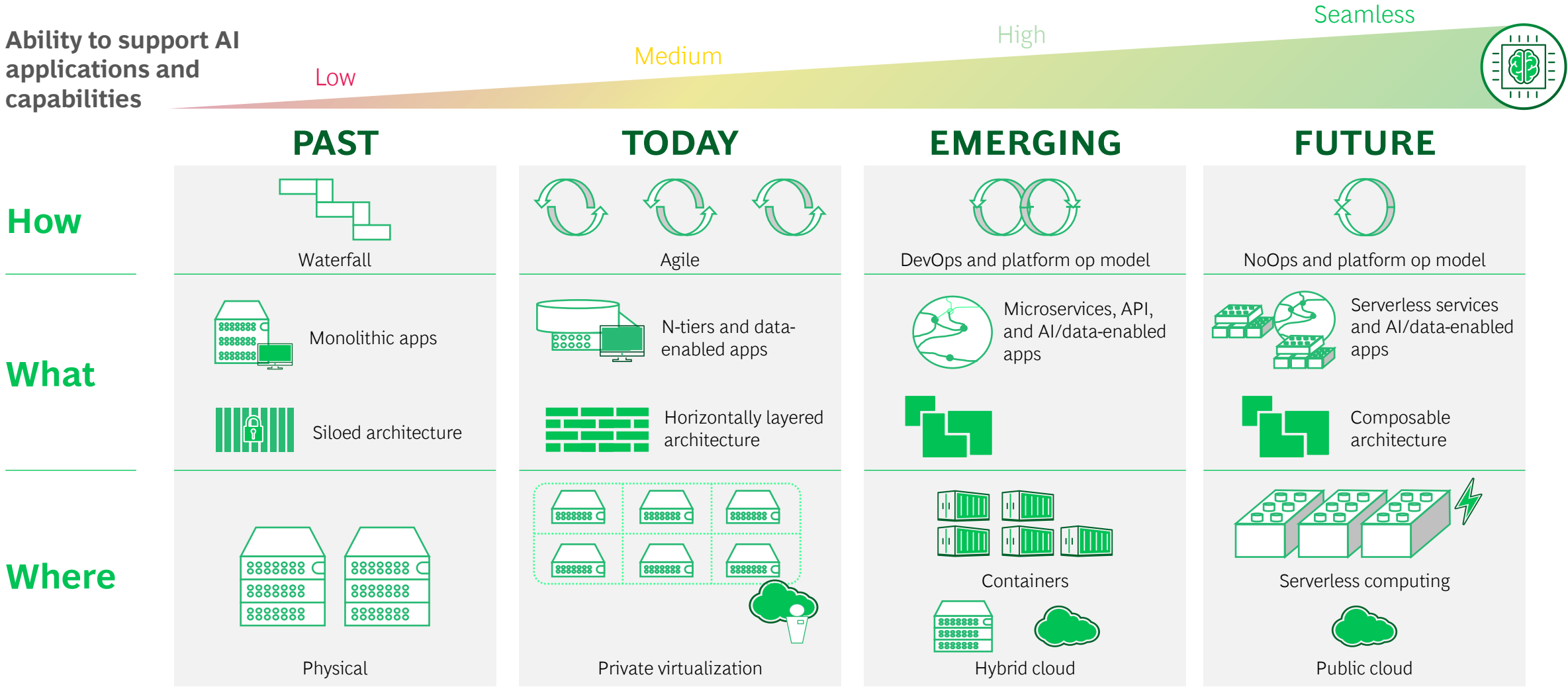
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- 2 | Do we have a clear strategy around which **models, platforms, data sets, and evaluation criteria we need to set up**?
- 3 | Are our **op model and current setup** lined up to efficiently deliver on our evolving tech stack/needs?
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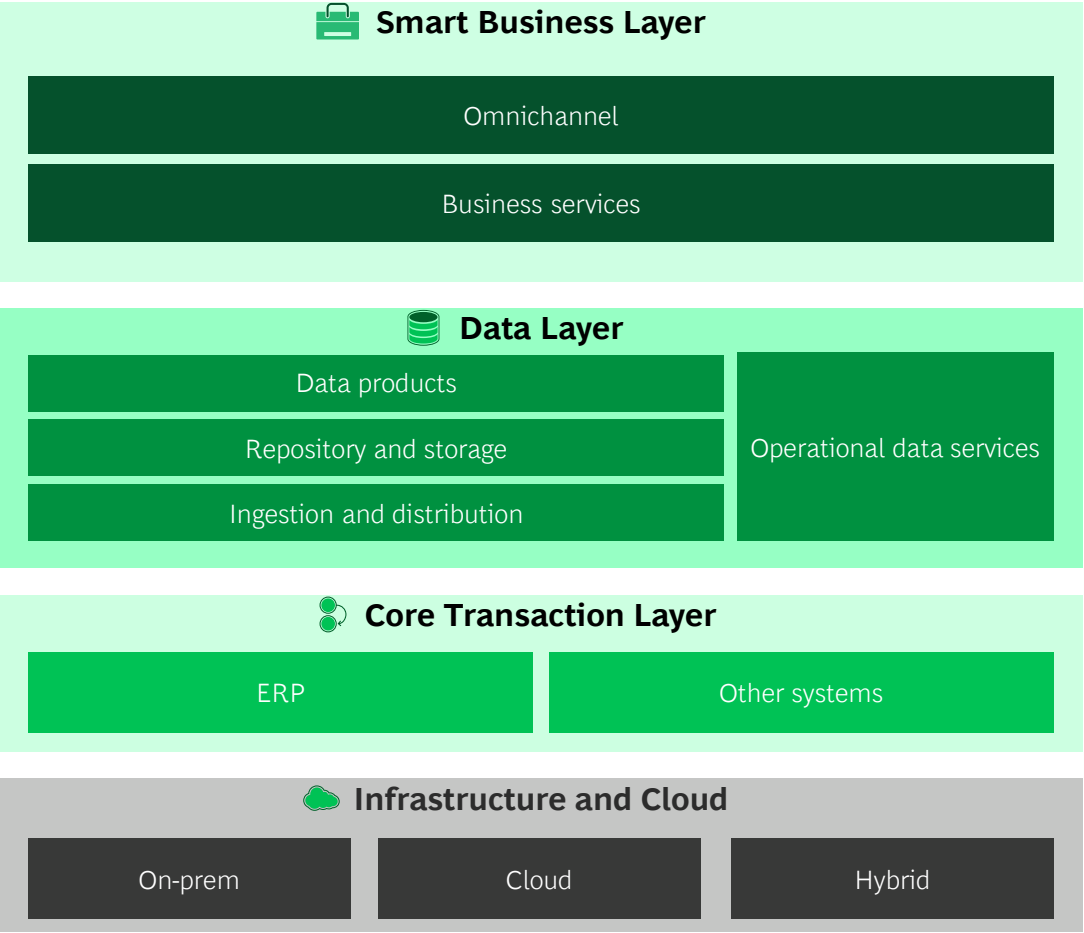
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Companies that are ahead in their tech modernization journey find it easier to deploy AI applications and capabilities

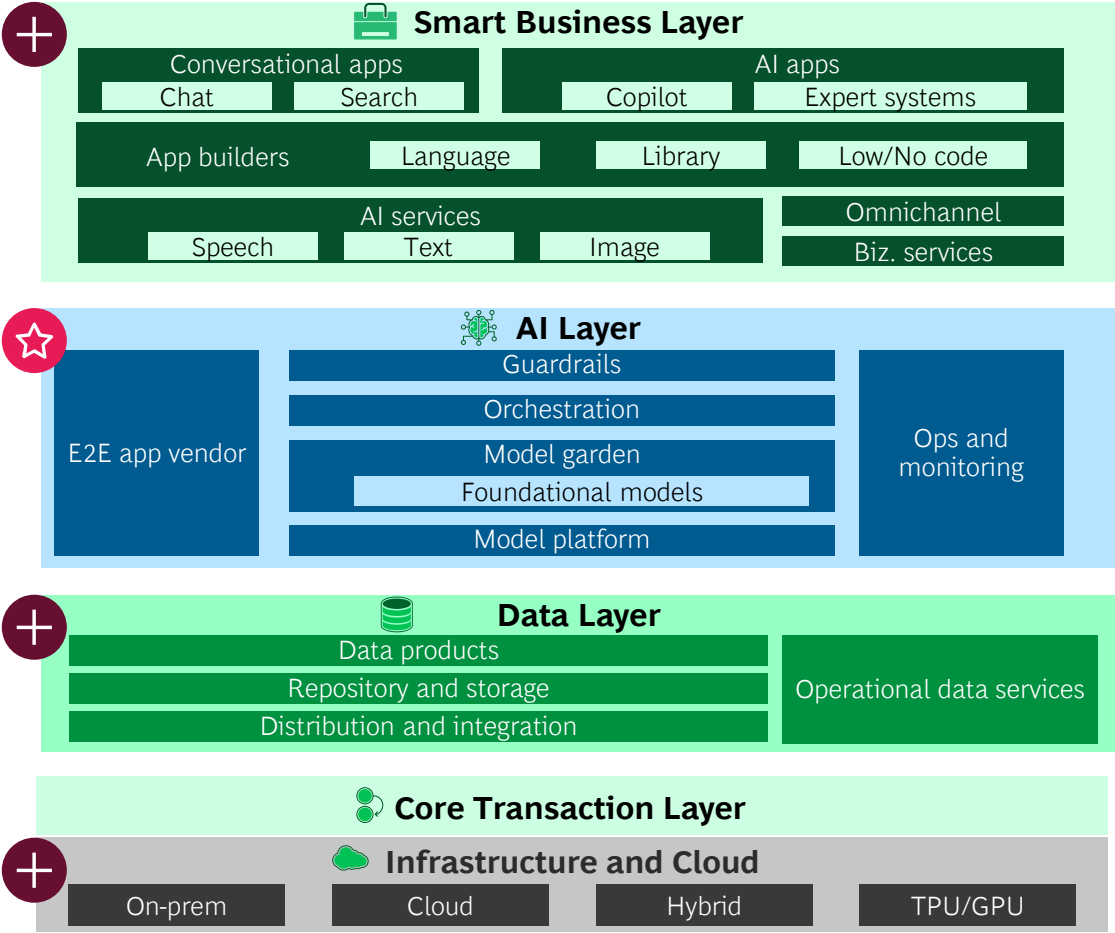


Looking closer at the stack, an incremental AI layer, coupled with improvements to existing layers, will lay the foundation for enabling AI applications

Today's data and digital platforms



> GenAI reshape: dedicated AI layer



☆ New layer + Existing layer capability upgrade

By modernizing their stack, leading companies across industries are driving innovation and growth and reaping material benefits from GenAI

Note: Select examples only; for more specifics about value capture, please refer to BCG's Executive Perspectives on respective topics

GenAI led task automation, content localization, and savings on research time	>	+20% savings in marketing costs	Multinational health CPG	Luxury automobile manufacturer	+50% efficiency gain	<	GenAI assisted tender document creation and offer analysis
GenAI sales assistant deployment vs. traditional touchpoints (search, retail media)	>	2X increase in ROI	Multinational cosmetics manufacturer	Large telecom company	+25% BU cost reduction	<	Leverage LLM to prioritize call deflection opportunities
GenAI assisted marketing content development	>	+80% external agency cost savings	Alcoholic beverages company	Large retail chain	\$1Bn additional sales	<	Increase in customer value perception through GenAI-based pricing and markdowns
GenAI leveraged to draft clinical study reports	>	+35% time efficiency gain	Consumer biopharma company	Pharmaceutical company	25% drug discovery time reduction	<	Cycle time reduction in drug discovery through GenAI-based lead optimization



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Modernizing four key areas of the current stack can appropriately enable and maximize value realization from AI

Deep dive to follow

1

MODELS

Diversify beyond a single model, including competitive open-source options as model adaptation becomes key for competitive advantage

2

PLATFORMS

Adopt AI platforms to centralize model hosting, streamline builds, and enhance scalability, effectively bridging talent gaps

3

DATA

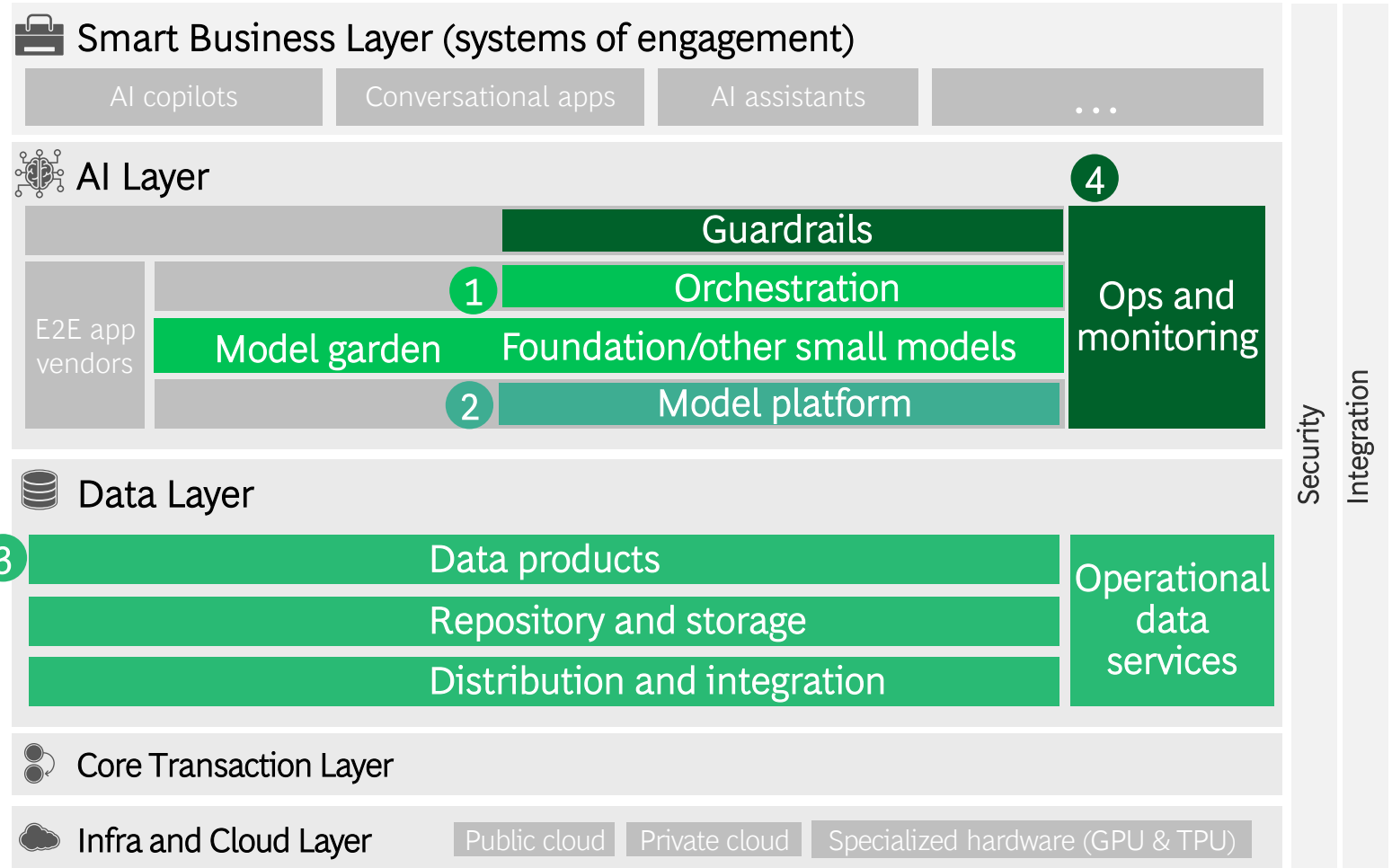
Leverage orchestration and model adaptation, bolstered by robust data capabilities and access to diverse data sets, to maintain competitive advantage

4

EVALUATION

Deep dive to follow

Build capabilities to measure success in response quality, technical performance, responsible AI, security, and cost



As large language models continue to proliferate, combining the right model selection criteria with the required platform capabilities is critical to scaling AI efforts

BCG's selection criteria framework helps companies find the right models at the right cost...

- 1

Model output
- 2

Model size
- 3

Model capabilities
- 4

Performance
- 5

Flexibility/Fine-tuning
- 6

Data sensitivity
- 7

Compatibility with platform/model provider
- 8

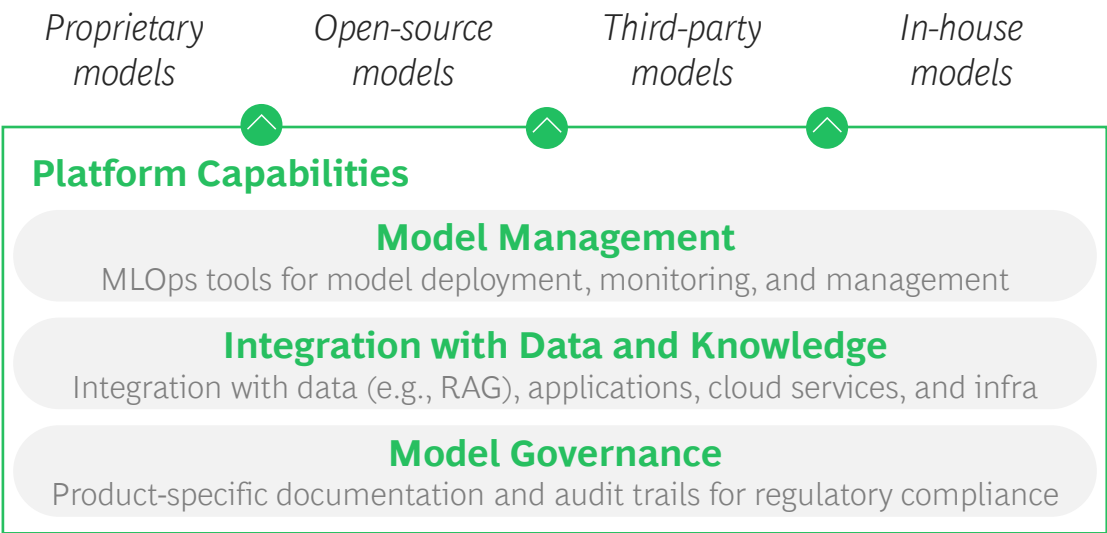
Economics
- 9

RAI¹ and regulatory
- 10

Optimization consideration

...and support those models with the right AI-platform built-in services

Model types



Partnerships can accelerate outcomes by simplifying development, testing, and deployment

1. Responsible AI

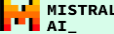
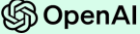


Infrastructure



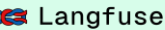
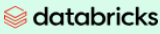


Infrastructure





Platforms





Applications



Expanding five critical capabilities enables organizations to measure ongoing success

Area		Evaluation criteria				Illustrative
 Response quality The extent to which responses from AI applications meet expectations	Content	☆ Relevance	☆ Specificity	☆ Truthfulness	...	
	Verbiage	☆ Emotional connection	☆ Language style	...		
 Technical performance The technical KPIs that AI solutions must achieve to fulfill business need	☆ Latency	Throughput	Availability	Resource consumption	...	
 Responsible AI The level of trust and ethical integration of AI solutions	☆ Fairness	☆ Interpretability	Compliance	Accountability	...	
 Business impact The amount of business value enabled by AI use cases – <i>function of above criteria as well as adoption, operating model, and change management</i>	ROI	Customer satisfaction	☆ Inference cost	Cost reduction	...	
 Security and privacy The extent to which the AI system is secure from threats and vulnerabilities	Data privacy	Access control	Model denial of service (DDoS)	☆ Prompt/Response monitoring	...	
☆ New or enhanced evaluation dimensions						

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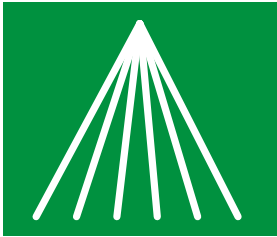


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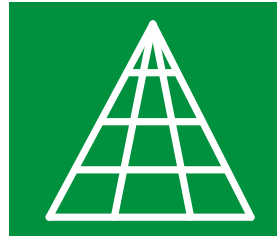
A platform-led organization that is fast and composable should implement a reshaped tech stack and benefit from the speed and agility it enables

Platforms deliver **shared products/services** that multiple BUs **combine and consume...**



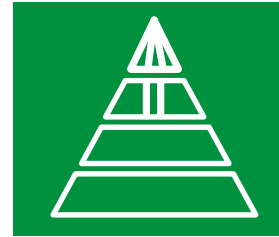
Traditional organization

- Business units and functions
- Silos and bespoke processes
- Hierarchical prioritization



Matrix organization

- Business units and functions
- Some shared capabilities
- Hierarchical prioritization



Platform operating model

- Business units driving missions
- Accelerated by shared platforms
- Dynamically aligned priorities

Common platforms with composable, reusable services to cut costs and boost efficiency

Teams focused on products and shared, reusable services based on self-service principles

Teams E2E responsible and enabled by cross-functional ways of working

...maximizing value from the **evolved AI stack**

1 Deploy AI solutions once with enterprise-wide impact



Eliminate duplicated capabilities



Avoid bespoke AI solutions

+30% Cost reduction by removing duplication

2 Create reusable AI platforms for whole enterprise



Set up a centralized AI capability



Provide standardized AI services

+25% Productivity inc. by combining capabilities

3 Unlock efficiency and agility



Bring data, people, and tech together



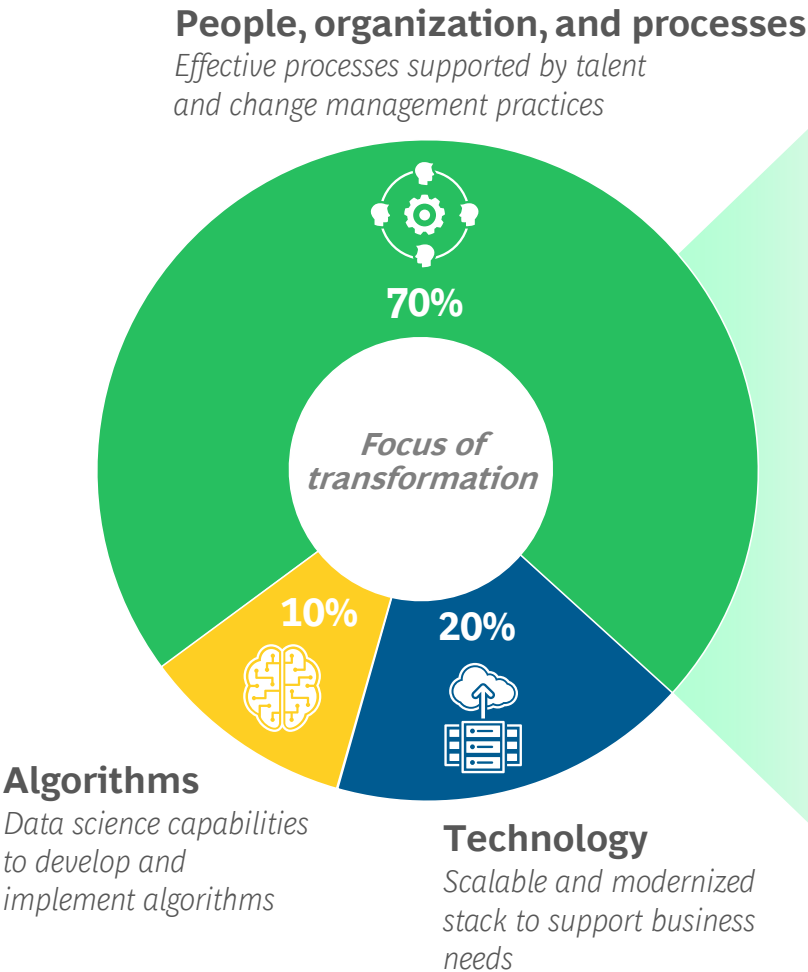
Enable quicker scaling of AI solutions

+50% Faster time to market

Top companies lean into the 10-20-70 principle to drive toward a platform-led organization; they see AI as mainly a people transformation vs. tech-only

70%

of the effort of digital/AI transformations is on people and processes



Non-exhaustive



Structure and roles

Deep dive to follow

- Reskilled teams to tackle **evolving responsibilities/roles**
- AI capabilities integrated in **cross-functional teams**



Governance, business outcomes, and ways of working

- **AI portfolio governance** fully integrated in POM portfolio
- **Iterative development and deployment** of new solutions and services and business outcome-based steering



Sourcing of talent and tech

- **AI capabilities/workforce planning** centrally orchestrated and built up within platforms
- **Increased AI collaboration** (insourcing vs. outsourcing)



Culture and behavior

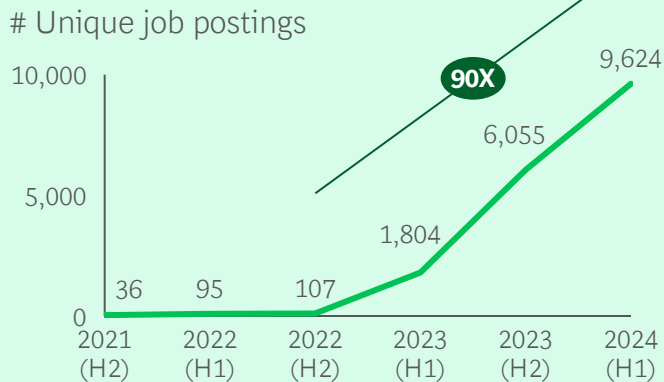
- Leaders engaging **on AI ambition and championing RAI**
- **Change management** strategies to help the workforce navigate and adapt to changes brought by AI

To adapt to AI, organizations need to adjust responsibilities and activities performed by employees...

AI is driving demand for new digital skills ...

- AI algorithms and methods
- Foundational models training
- Model fine-tuning
- Prompt engineering
- ...

Number of job postings requiring GenAI-related skills (US)



Source: Job postings data from Lightcast; BCG analysis

Non-exhaustive

... and also fundamentally evolving the day-to-day activities across roles

Integration with intelligent machines	Reduced communication tasks	Increased cross-functional teaming	Enhanced evaluative thinking	Expedited decision making
Employees will increasingly need to integrate their workflow with the capabilities of intelligent machines and seamlessly interact together	Automation will help cross-functional teams communicate seamlessly across multiple channels by breaking down information silos	With the increasing complexity of work, teams will need to become more cross-functional to achieve business objectives	Employees will be required to critically evaluate the output of AI tools and identify potential biases or errors	Automation will bring more visibility into timelines and bottlenecks to enable faster decision making and accountability

... while introducing new IT roles, reskilling product roles, and developing new skills

1 New tech and digital roles needed ...

Required roles	New requirements
Chief AI officer	Oversee and implement AI initiatives
AI ethics and compliance officer	Develop/implement ethics and compliance policies
AI/ML governance specialist	Establish governance framework for responsible use of data and AI
LLM¹ ops engineer	Simplify and automate prompt process and model fine-tuning
Prompt engineer	Improve prompt results to create consistent outputs across use cases
LLM engineer	Design LLM model pipelines

2 ... to enable teams that build AI products and skills...

AI team roles	Responsibilities
Product manager	Manage everyday team activities and better understand AI capabilities
Business analyst	Help capture the business logic
Data engineer	Prepare data in a usable form
Data scientist	Design AI analytical models
Software developer	Develop scalable code for AI applications

3 ... supported by other roles that will evolve too

Existing roles ²	New requirements
Engineer	Have prompt engineering skills
UI/UX designer	Design AI interfaces
Data analyst	Work with high volumes of data
Cybersecurity roles	Address new risks to consider

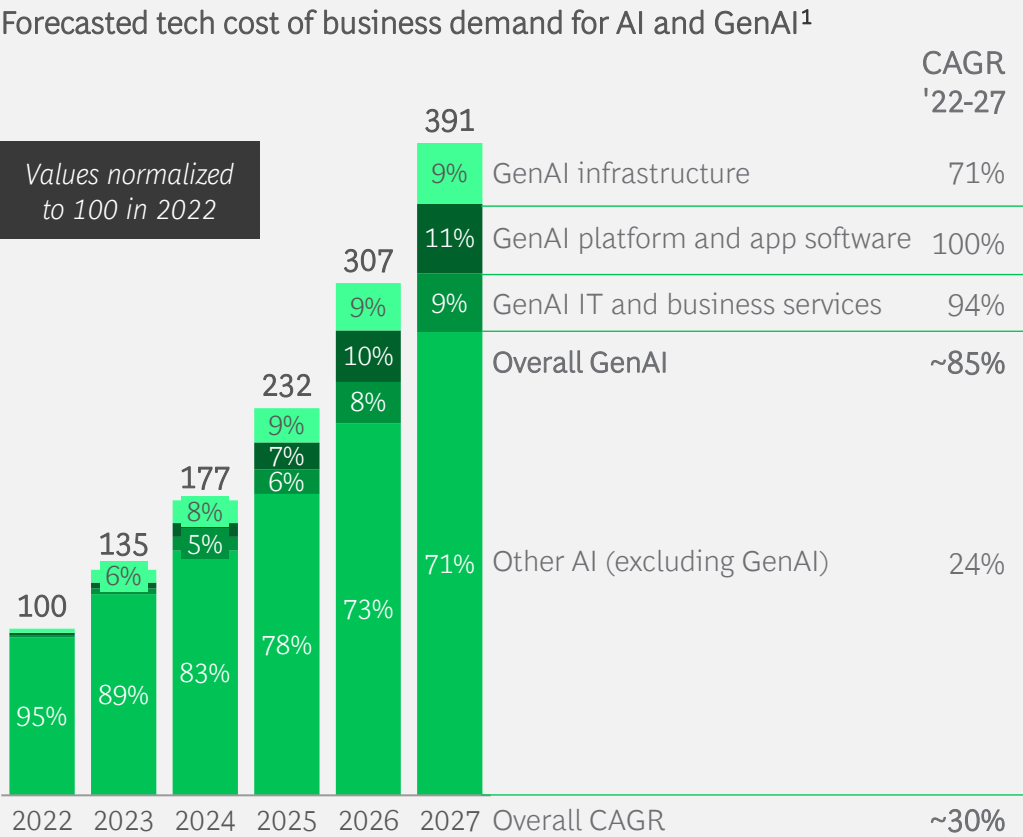
A man and a woman are sitting on a modern wooden bench in a bright, contemporary office space. The man, on the left, is wearing a dark jacket and jeans, and is looking down at a laptop. The woman, on the right, is wearing a light blue shirt and red pants, and is also looking at the laptop. They are positioned in front of a large window that offers a view of a green landscape. The overall atmosphere is professional and collaborative.

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With AI spending expected to rise with a CAGR of ~30% (and ~85% for GenAI), companies are prioritizing different levers to control AI-related IT costs

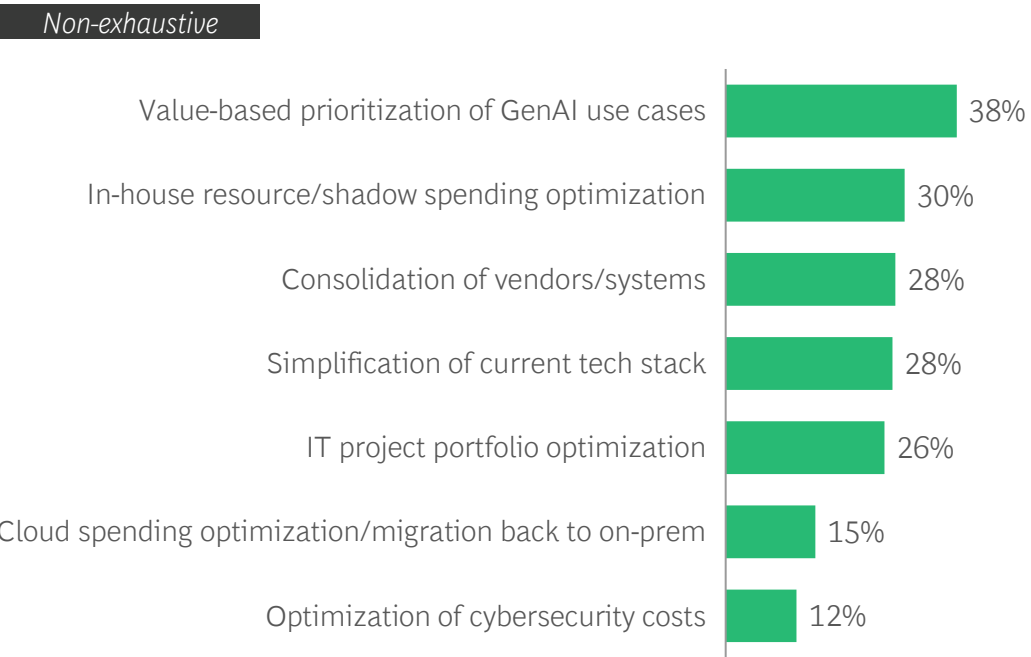
AI is predicted to drive technology costs for businesses with a CAGR of ~30% until 2027



1. IDC AI Implementation Market Outlook: Worldwide Core IT Spending for AI Forecast, December 2023. 2. Build for the Future Research 2024 (n=1,000 respondents)
Note: Core IT spending includes infrastructure hardware, software, public cloud services, and IT/business services (devices and telecommunications services excluded)
Source: BCG case experience

Different levers are being adopted by companies to control AI-related costs

Q: What cost reduction measure(s) are you planning to prioritize in the coming year to control AI/GenAI-related IT costs?² [Multiple choice question]

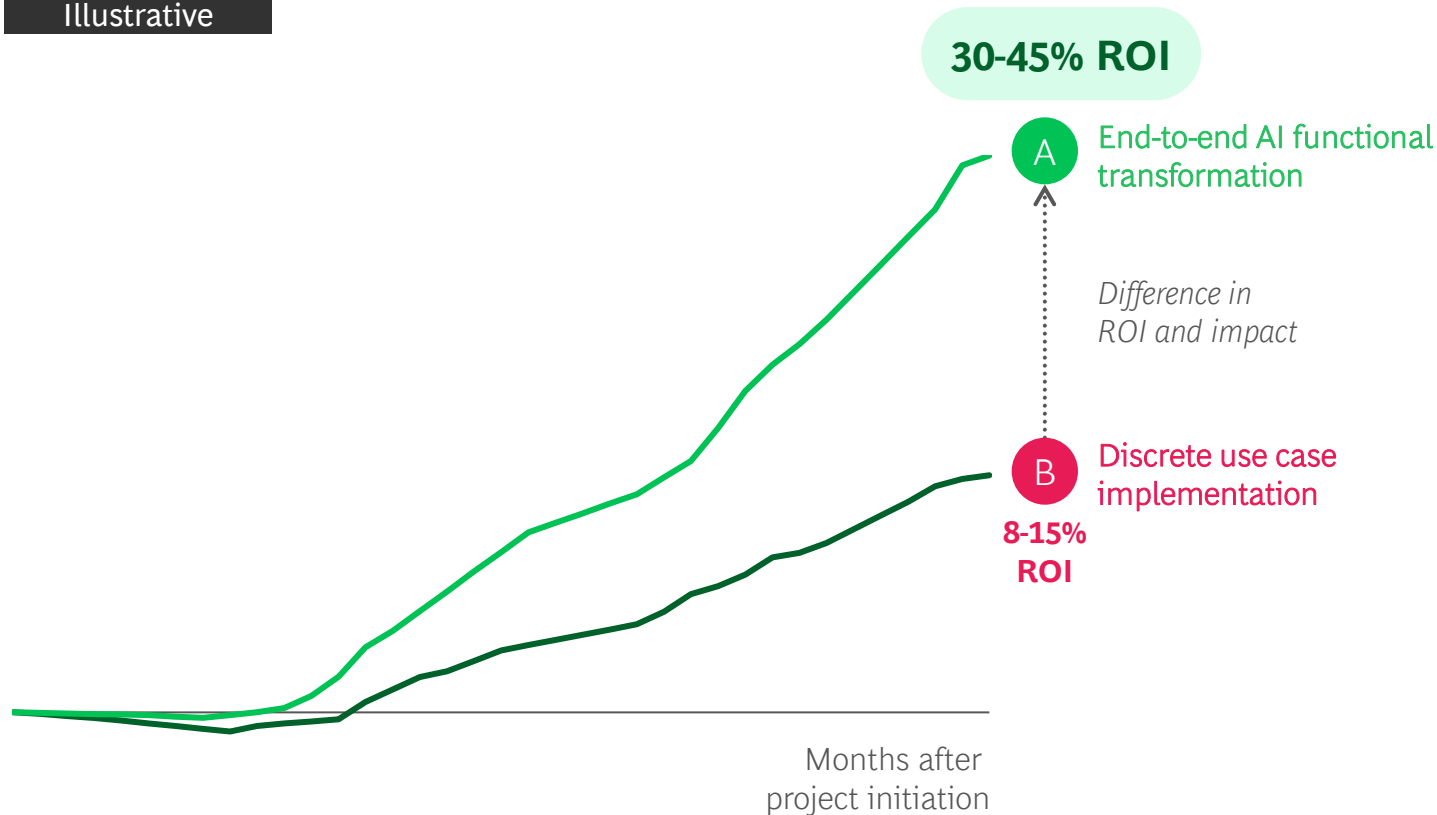


To maximize value, it's key to adopt an approach that reimagines functional processes, builds AI platforms, and establishes guardrails to control cost and risk



Transformation approach delivers 3-4X ROI

Illustrative



Source: Build for the Future Research 2022/23



Key ingredients

1

Proof of value

E2E reimagining of a functional process—not isolated use cases – with concrete evaluations proving impact

2

Proof of scale

Ability to deliver AI platforms, backed by scaled data products, serving many functions, and with platform economics

3

Proof of control

Meeting the business where it is; controlling costs (people + tech), ethical and bias risks, cyber risk, and data risk (scale without control is chaos)



How to get started



Getting started | Practical next steps for CTOs to get ready for their AI transformation

- 1 Set aspiration and objectives**
 - ❑ Develop an **AI aspiration aligned with strategic business priorities**
 - ❑ Establish **key objectives and measurable success criteria** for tracking AI initiatives
- 2 Understand capabilities of your current stack**
 - ❑ **Identify key gaps** and the largest opportunity areas to strengthen AI tech stack
 - ❑ Benchmark existing **tech stack capabilities and maturity versus peers**
- 3 Invest in foundational capabilities**
 - ❑ **Develop robust data layer** to ensure data quality, reliability, and accessibility
 - ❑ Implement **scalable infrastructure** to support advanced AI models
 - ❑ Identify and build **key technical skills required** (e.g., AI programming)
- 4 Prioritize building capabilities for AI layer**
 - ❑ Build key GenAI layers including **models, platforms, guardrails, and orchestration**
 - ❑ Establish capabilities to **evaluate and measure** success across performance, cost, and RAI
 - ❑ Identify and drive **changes in operating model and ways of working** to maximize value
- 5 Scale broadly via a platform-based org**
 - ❑ **Further widen the platform operating model** to maximize value from AI tech stack
 - ❑ Implement capabilities through **AI-focused structures** (e.g., CoEs for RAI)
 - ❑ **Drive continuous development** and change management for new AI solutions/services

BCG experts | Key contacts for data and digital platform transformation

NAMR



Vladimir
Lukic



David
Martin



Julie
Bedard



Matthew
Kropp



Beth
Viner



Djon
Kleine

EMESA



Nicolas
de Bellefonds



Marc
Schuuring



Marcus
Wittig



Julien
Marx



Remco
Mol



Dan
Sack



Adrien
Duthoit



Tom
Martin

APAC



Jeff
Walters



Julian
King



Aparna
Kapoor



Romain de
Laubier



Akira
Abe



Nipun
Kalra

BCG

