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Efficiency Unleashed: Navigating the Future with Generative AI in Construction

Presentation for SICA Contractor, Consultant and Owner Workshop

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3 Topics For Today

01 Why the construction industry is ready for disruption

02 How Generative AI can help with efficiency and productivity

03 How can you start or accelerate your journey

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01

Construction:
An industry ready
for disruption

2007:
A stable industry is
disrupted by emerging technology

Challenges facing Canadian construction

Canadian Interest Rates

Escalation and Inflation of Costs

Supply Chain Disruption

Low Project Performance and Increased Scrutiny

Skilled Labour Shortages

High Competition and Low Margins

Barriers to technology adoption

Higher degree of unstructured data

Lower degree of digitization and accessibility of tools

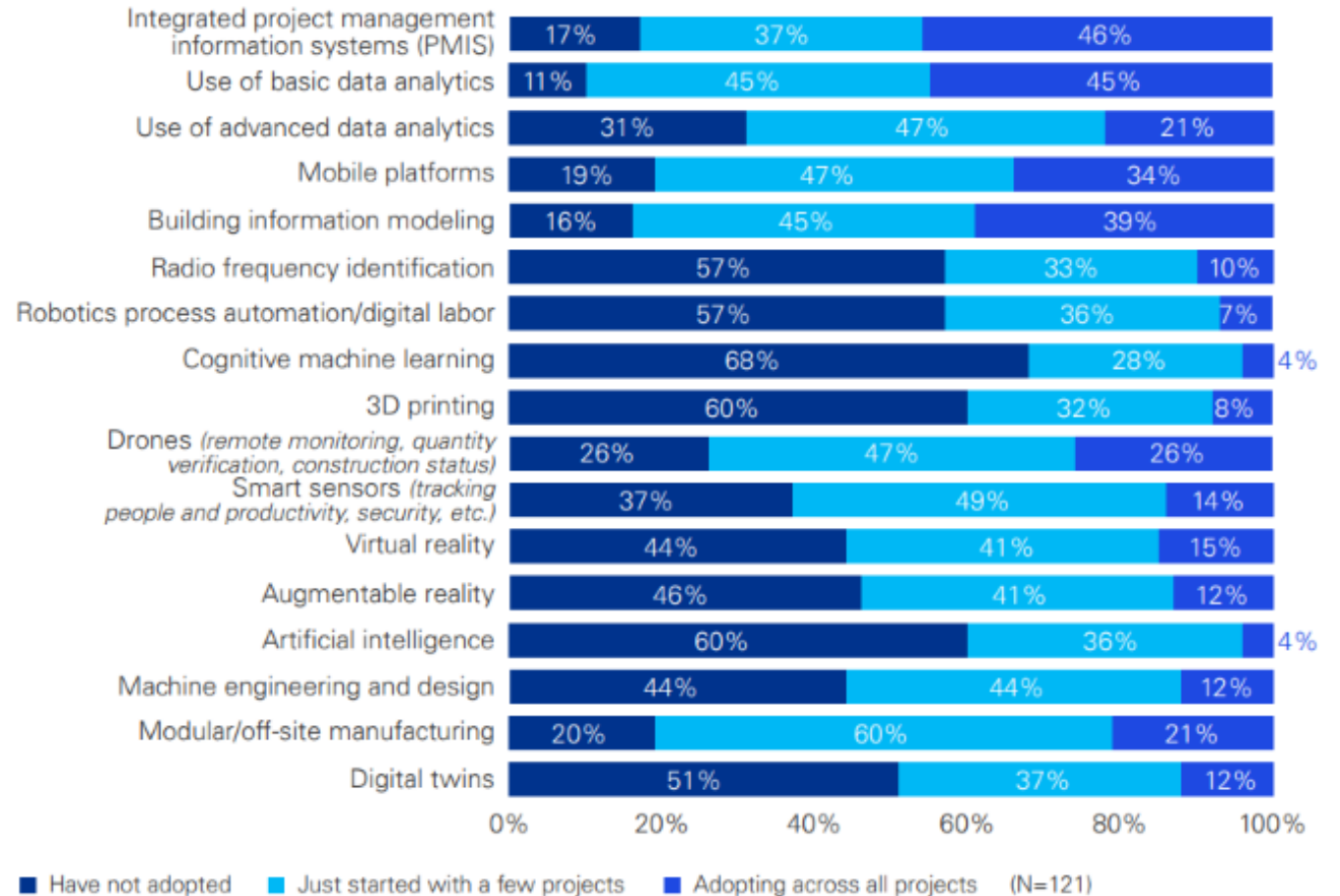High degree of SMBs with limited sized IT and data teams

Use Case vs Technology Mismatch (high costs for solutions)

Talent war for tech talent

Despite this, the great innovation race has already started

Across all industries, KPMG's Generative AI Adoption Index reported a 32% annualized increase in the number of Canadian workers using Generative AI at work
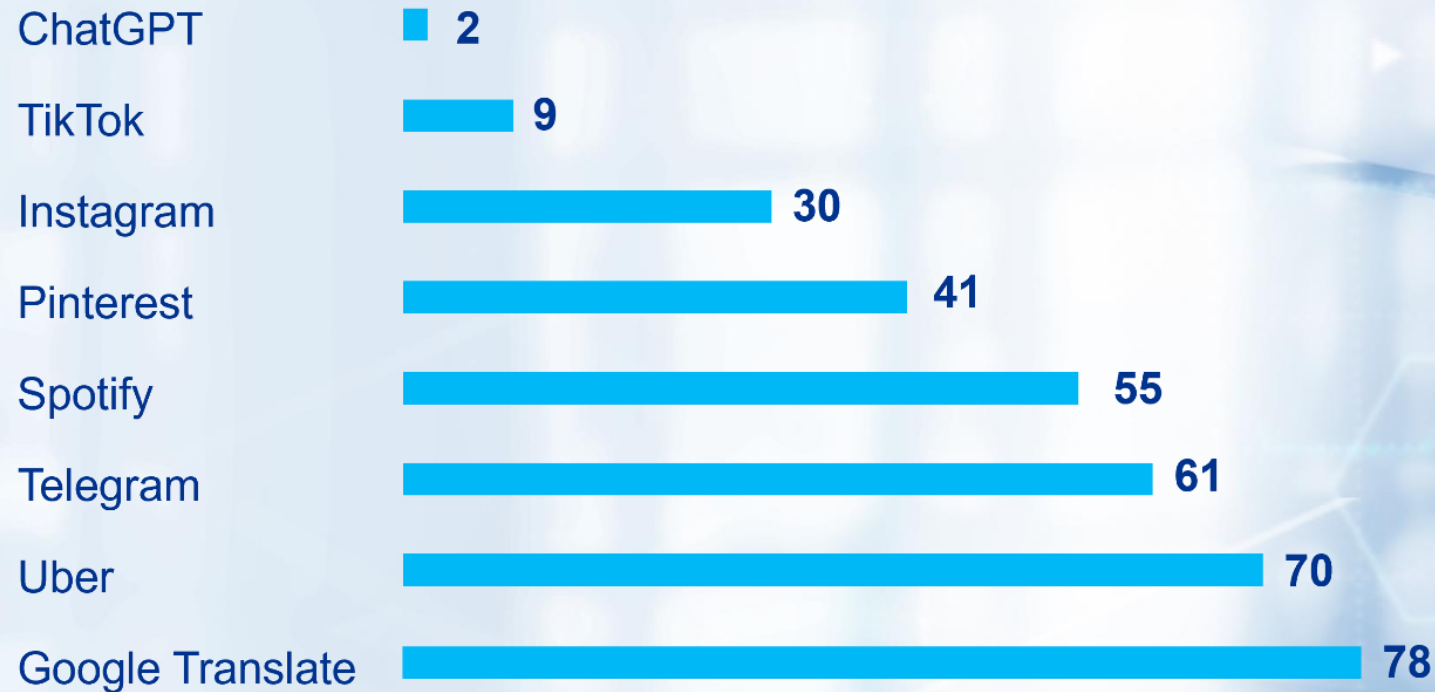
Exhibit 15: Please rate your level of adoption of each of the following technologies

E&C firms

Technology	Have not adopted	Just started with a few projects	Adopting across all projects
Integrated project management information systems (PMIS)	17%	37%	46%
Use of basic data analytics	11%	45%	45%
Use of advanced data analytics	31%	47%	21%
Mobile platforms	19%	47%	34%
Building information modeling	16%	45%	39%
Radio frequency identification	57%	33%	10%
Robotics process automation/digital labor	57%	36%	7%
Cognitive machine learning	68%	28%	4%
3D printing	60%	32%	8%
Drones (remote monitoring, quantity verification, construction status)	26%	47%	26%
Smart sensors (tracking people and productivity, security, etc.)	37%	49%	14%
Virtual reality	44%	41%	15%
Augmentable reality	46%	41%	12%
Artificial intelligence	60%	36%	4%
Machine engineering and design	44%	44%	12%
Modular/off-site manufacturing	20%	60%	21%
Digital twins	51%	37%	12%

■ Have not adopted ■ Just started with a few projects ■ Adopting across all projects   (N=121)

Source: Familiar Challenges – New Approaches – KPMG 2023 Global Construction Survey

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The rapid rise of Generative AI

# of months to hit 100M monthly users:

ChatGPT	▪ 2
TikTok	9
Instagram	30
Pinterest	41
Spotify	55
Telegram	61
Uber	70
Google Translate	78

02
Why Generative AI can help
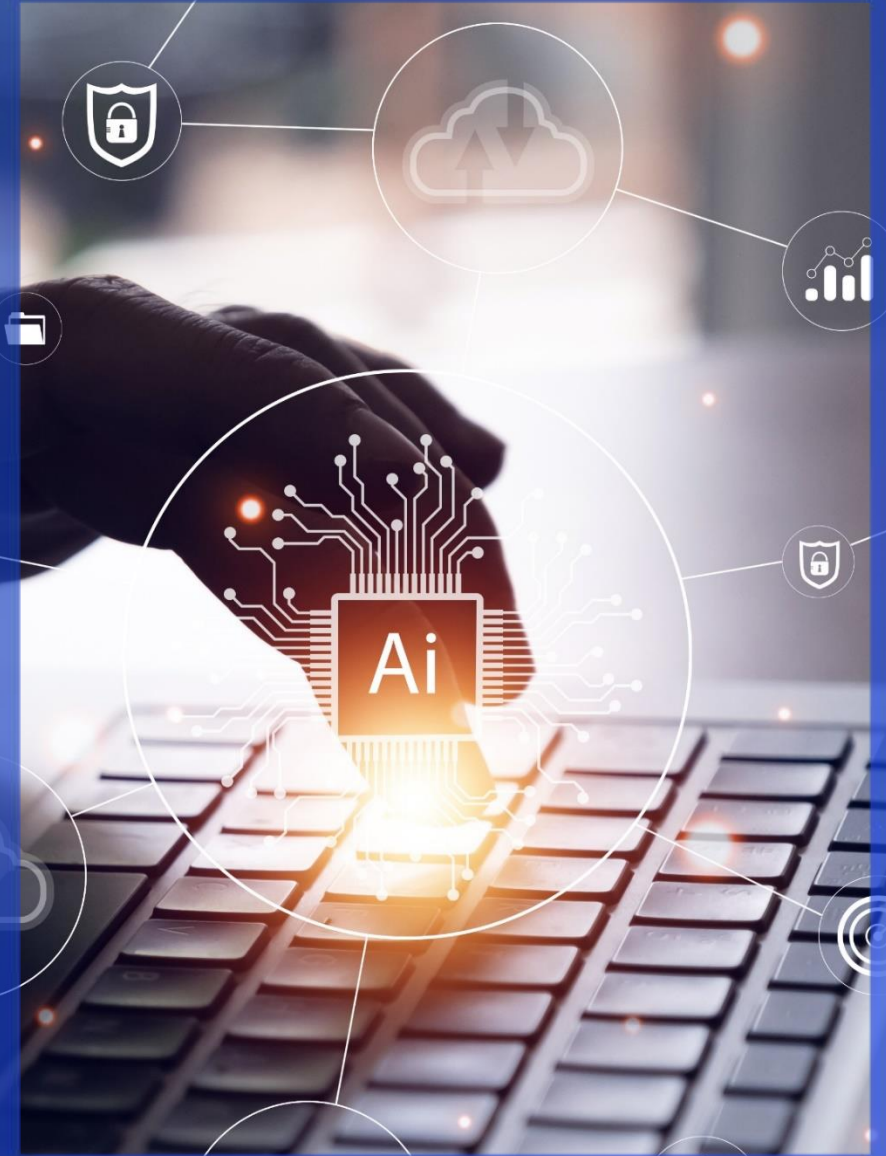
What is Generative AI?

Generative AI refers to artificial intelligence that can generate <u>novel content</u>, rather than simply analyzing or acting on existing data.

Generative AI uses complex machine learning models to create content – text, images, even software code – based on the input it receives from the user and its understanding of the data it has access to.
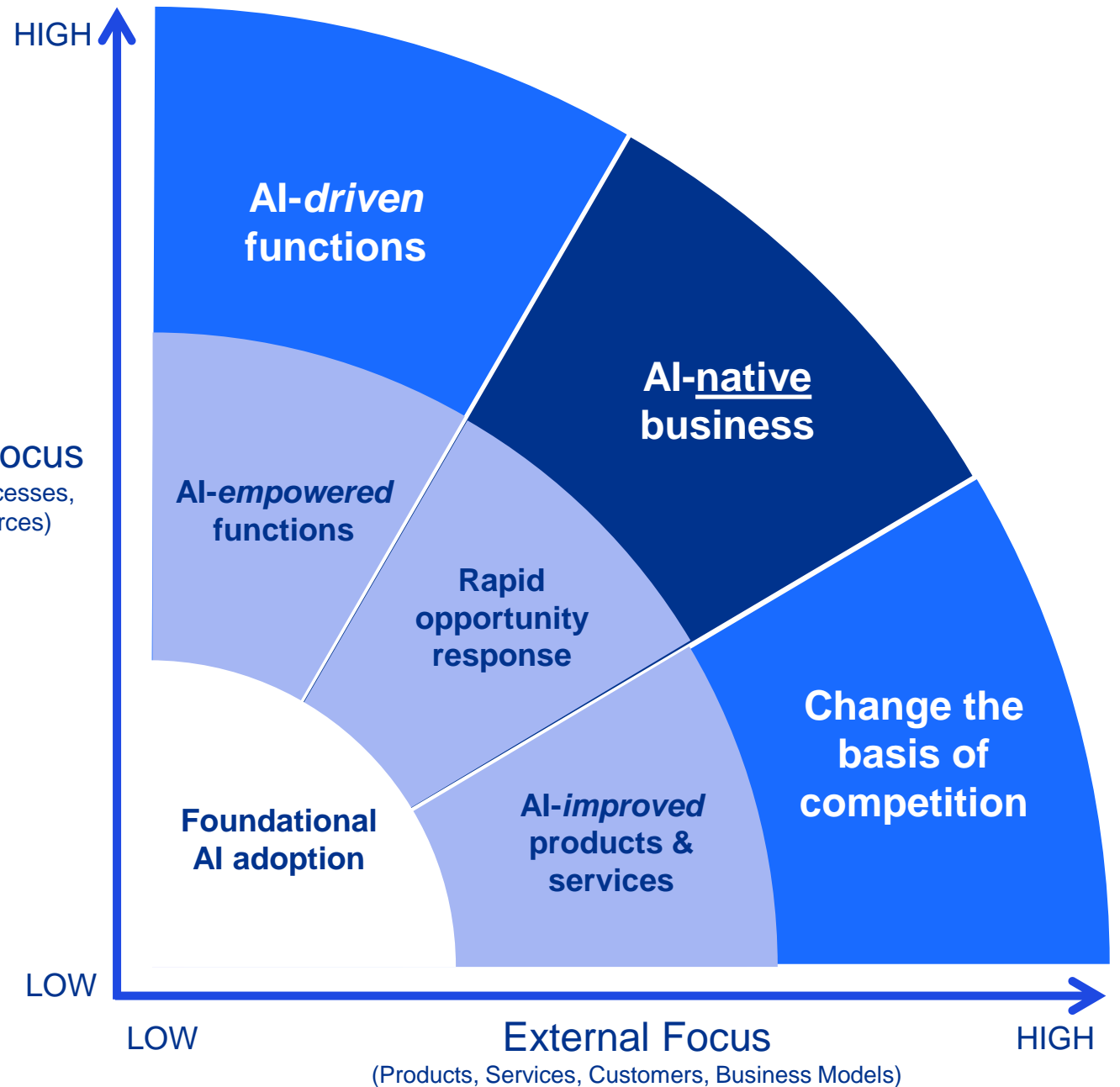
This fundamentally changes the human-machine interaction and opens an unlimited number of potential use cases.

AI is not just a technology; it's a *paradigm* shift.

Internal Focus
(Systems, Processes, Data, Resources)

HIGH

AI-*driven* functions

AI-*native* business

AI-*empowered* functions

Rapid opportunity response

Change the basis of competition

Foundational AI adoption

AI-*improved* products & services

LOW

LOW   External Focus   HIGH
(Products, Services, Customers, Business Models)

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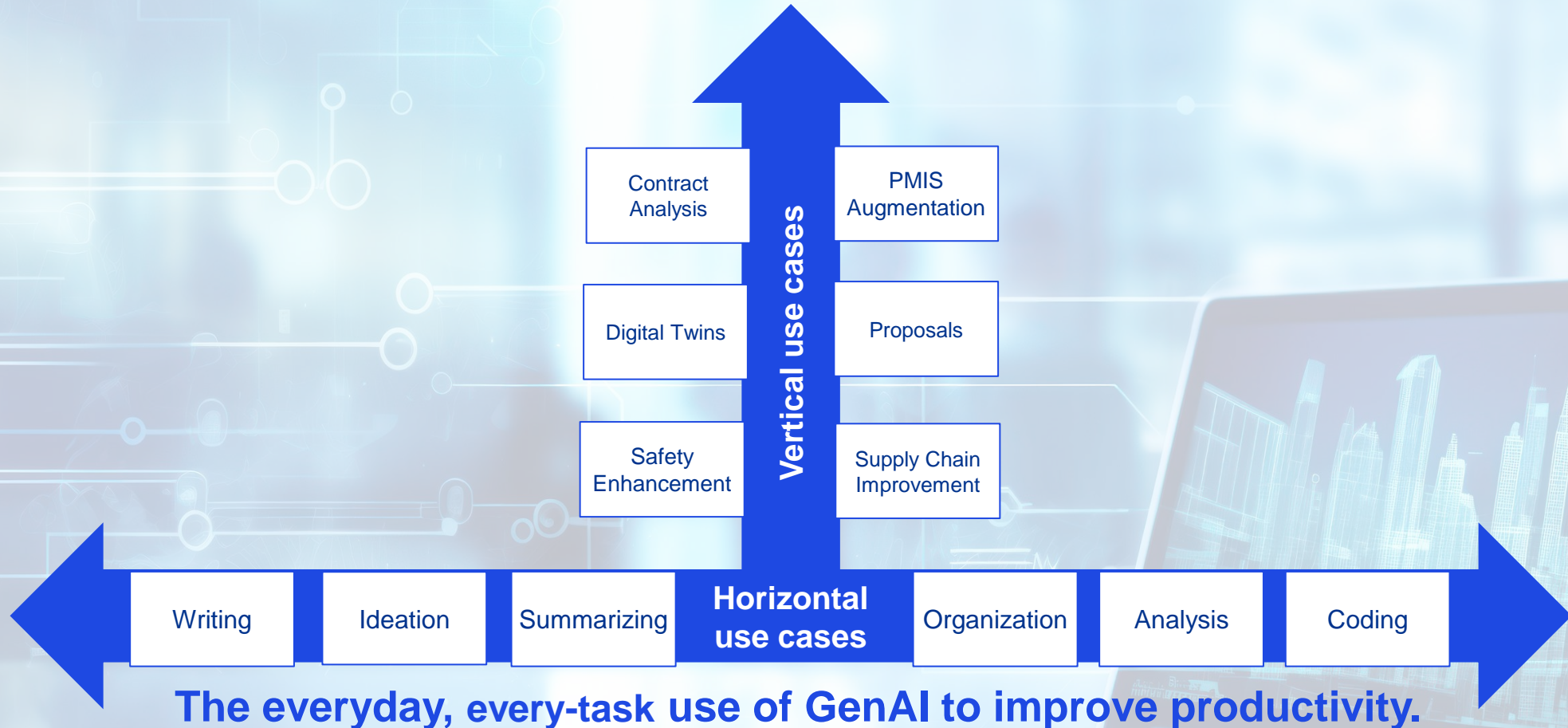
Generative AI in contract analysis

Generative AI can be used to *assist* legal professionals in the analysis of construction contracts. Specific use cases include:

- Cross-referencing contracts against established playbooks
- Semantic meaning of changes in contracts and supplementary conditions
- Establishing new templates
- Negotiations
- Knowledge Management

Digital assistant improving productivity

Generative AI can be used as a virtual assistant to help with increased productivity and efficiency.

Specific use cases include:

- First drafts of letters and emails
- Meeting scribe
- Scheduling and resource allocation
- Quotes and Estimation
- Document summarization
- Smart and semantic search
- Questions and answers / chatbot
- Proofreading

"Kleo" Demo – KPMG's Internal GenAI Platform

Tax Quick Hitters

- Greater access to Small Business Deductions

- Grants and Eligible Expenditures

- Interest rate solutions

- Recession Proofing

- Tips for budgeting

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Improving Safety With Digital Tools

AI can be used to improve site safety
Specific use cases include:

- Object detection (PPE detection)

- Hazard identification

- Optimizing site layouts

- Training content generation

- Predictive maintenance to reduce accidents

- Reducing human inspection and scanning (drones, 3D scanning)

Image credit: V3 Smart Technologies

03

How can you start

Start slow if you must, but start

POC development

Full build

Learn, adjust & develop new use cases

(5)

(7)

(8)

Validate solution(s)

(6)

PHASE 1: LEARN & EXPERIMENT

PHASE 2: SCALE & ACCELERATE

Why? (1)

Where? (2)

How? (3)

(4)

(9)

Use case ID

Train & disperse knowledge
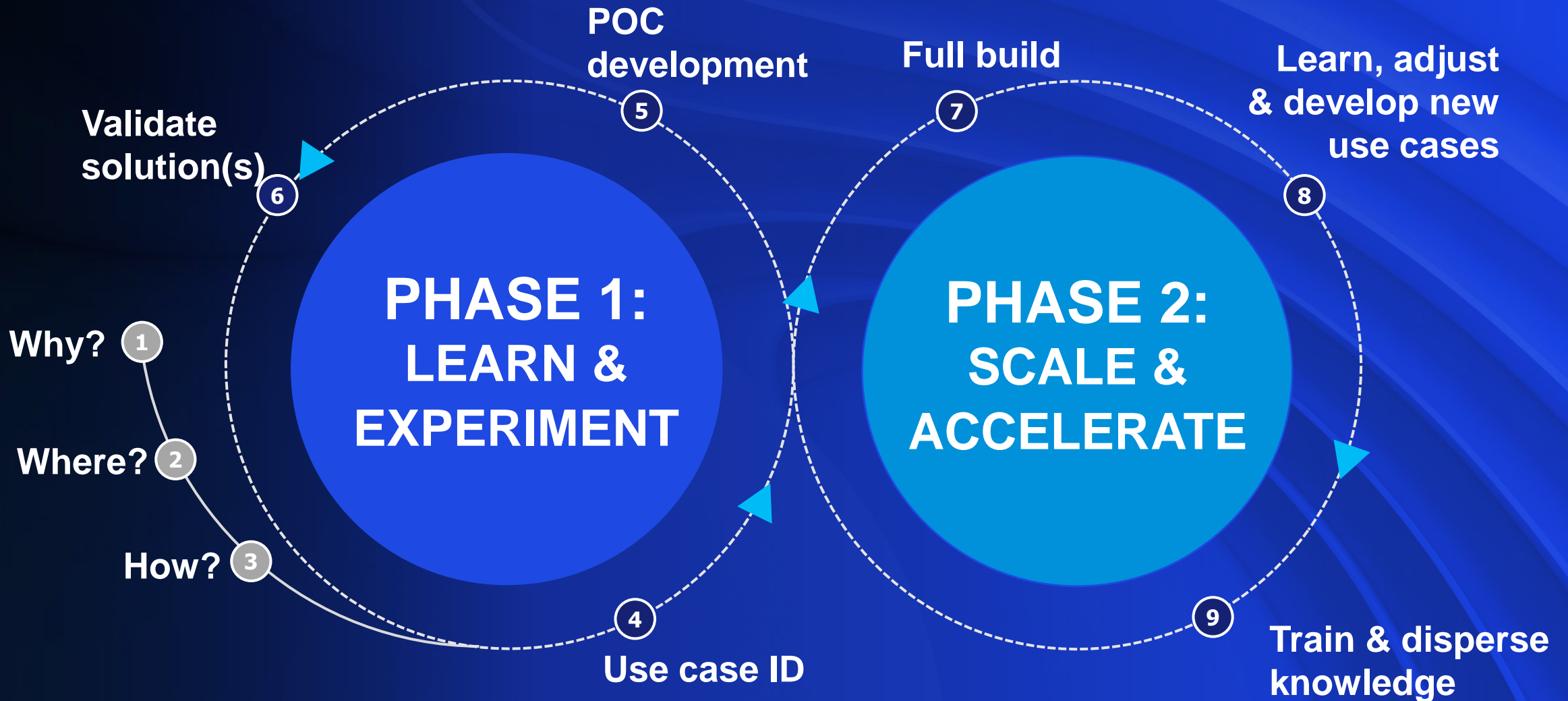
Build Responsible AI Governance

KPMG's Trusted AI Framework

Outer ring: Fairness, Explainability, Accountability, Security, Privacy, Safety, Data integrity, Reliability

Middle ring: Strategy and development, Data preparation, Modeling, Machine learning operations, Evaluation, Deployment and optimization, AI security, AI ethics and governance

Center: Trusted AI

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Assess your data capabilities

Circular diagram with **DATA STRATEGY** at the center, surrounded by four segments: **PROCESSES**, **PEOPLE**, **TECHNOLOGY**, **GOVERNANCE**.

Key questions to ask yourself after this session:

1. What are our strategic priorities? What data do we need to achieve them? Do we know where to find the data? Do we know its quality?

2. What data awareness training has been provided to our staff?

3. Do we have roles and responsibilities related to the management and governance of data defined?

4. How do we resolve issues related to data management? Is there leadership oversight?

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Empower your workforce

Enhanced design capabilities

Utilize algorithms to assist in optimal designs with specified parameters (safety, thrill factor, space limitations).

Design augmentation

Automate routine tasks, allowing your designers and engineers to focus on higher level creativity, problem-solving, and customization.

Speed and efficiency – Time-to-Market

Automate and expedite proposal and design processes to speed up creation/iteration of designs and responses, resulting in quicker turnaround times and faster overall product development cycles.

Opportunities for new offerings

Expedited workflows will allow your team more time to increase value for your clients in new and innovative ways.

Customization and personalization

Identify innovative and effective designs that meet customer preferences, potentially developing superior products compared to competitors.

Accurately measure + report success metrics

Unstructured data generated by your team can be leveraged to accurately measure and report on OKRs.

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KPMG's AI offering has three interconnected solutions.
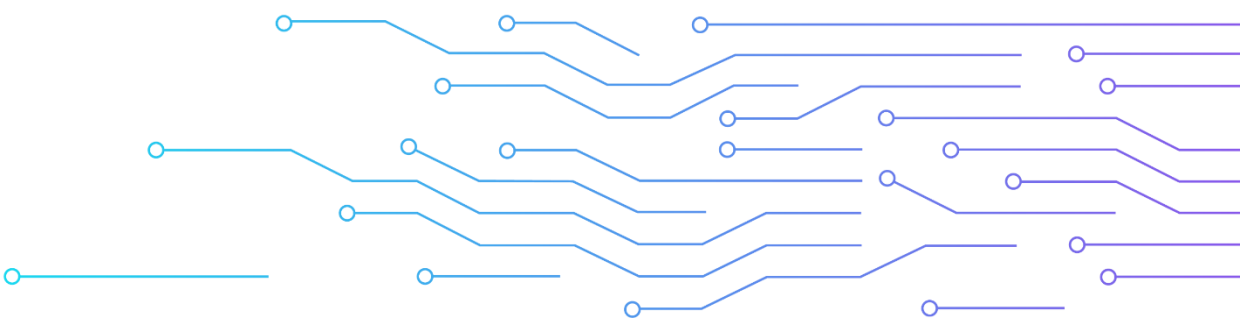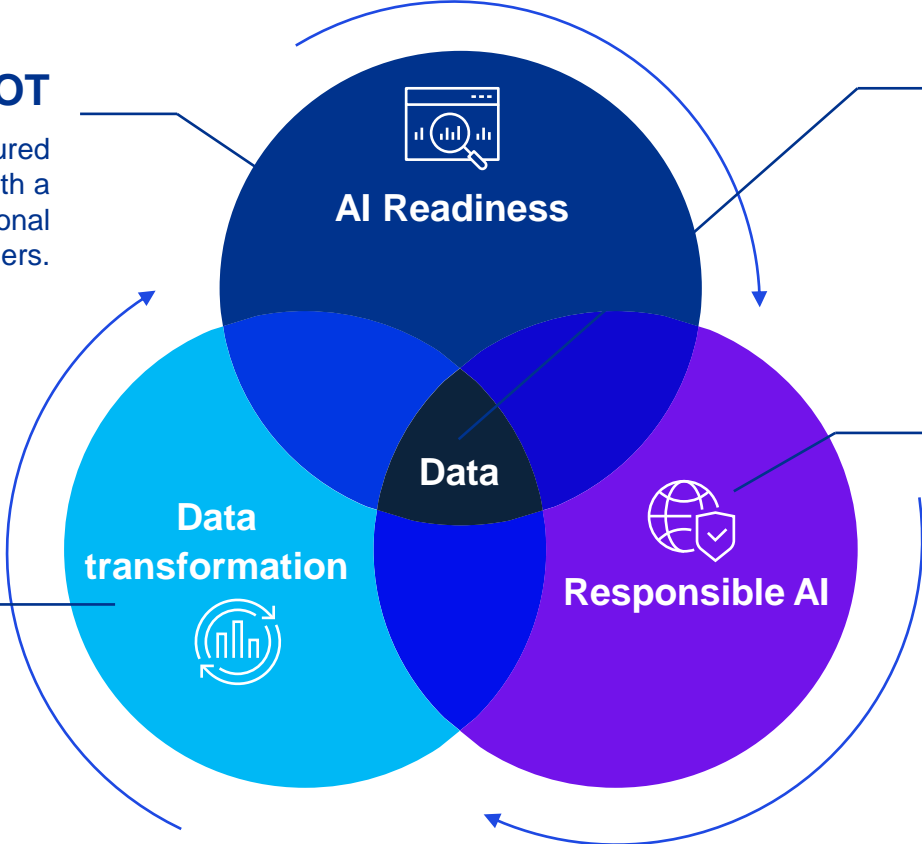
ASSESS • STRATEGIZE • PILOT

We guide clients through a tailored, structured journey from ideation to proof of concept, with a constant focus on business objectives, organizational alignment, your people and customers.

DATA IS THE FUEL

Generative is the accelerator.

INTEGRATE • ACCELERATE • SCALE

We empower clients to unlock the full potential of AI by streamlining and modernizing their data systems, models and algorithms, overcoming challenges such as disparate data, integration, and inefficient workflows.

PROTECT • TRUST • GOVERN

We help clients manage AI risk with frameworks and tools that ensure secure, legal and ethical AI use, with appropriate governance for ongoing monitoring, while promoting trust.

AI Readiness

Data transformation

Responsible AI

Data

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KPMG AI Service Offerings

Service		Activities	Typical Duration
01	**(AI) Data Maturity / Readiness Assessment**	✓ Understand the maturity and readiness of your data management capabilities. The availability, quality of your data is key to the success of any AI investment because an AI capability is trained on data ("garbage in / garbage out").	5 - 10 weeks
02	**AI Use Case Discovery**	✓ Gather, validate and prioritize requirements for AI use cases with your stakeholders (up to 3 use cases in a catalogue).	4 - 6 weeks
03	**AI Investment Business Case**	✓ Prepare a project / initiative business case with evaluation of resources invested, use cases, qualified business benefits and/or cost-benefit, quantitative benefits.	4 - 6 weeks
04	**AI Use Case Tools Market Scan**	✓ Conduct research in the market for peer organizations' use of AI of similar use cases that you've identified. ✓ Understand which AI tools are established in the market and assess fit for your use cases.	4 - 12 weeks (longer 12 weeks if demos / RFP / negotiation support)
05	**AI Proof-of-Concept (POC) Build for 1 Use Case**	✓ Gather and validate the requirements and data with your stakeholders. ✓ Achieve business and technology stakeholder engagement. ✓ Build / deploy small POC and get stakeholder feedback. ✓ Plan for post POC deployment.	4 - 6 weeks

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Key takeaways

01 The construction industry will be disrupted by Generative AI and advanced digital capabilities. The time to get ready is right now!

02 Starting or accelerating your journey can be accomplished with a strong AI strategy, a Responsible AI framework, understanding data and readying the workforce.

03 Help is available. You do not need to do this alone.

Use your smart phone camera or QR scanner

Access Insights from KPMG's
Building, Construction and Real Estate Website

Q&A