

Session 10:
Technology, Artificial Intelligence, and Data Analytics

AI and Foreign Reserves Management

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AI and Foreign Reserves Management

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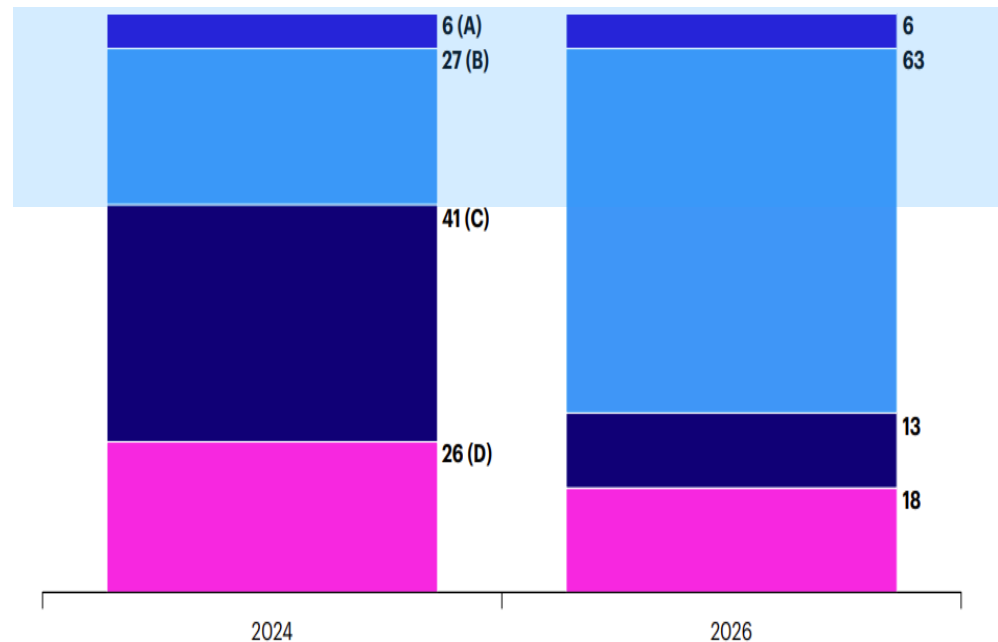
Agenda

- Trends and opportunities in AI
- Challenges and responsible AI framework
- World Bank Group's perspectives on AI
- Key takeaways

Trends and opportunities in AI

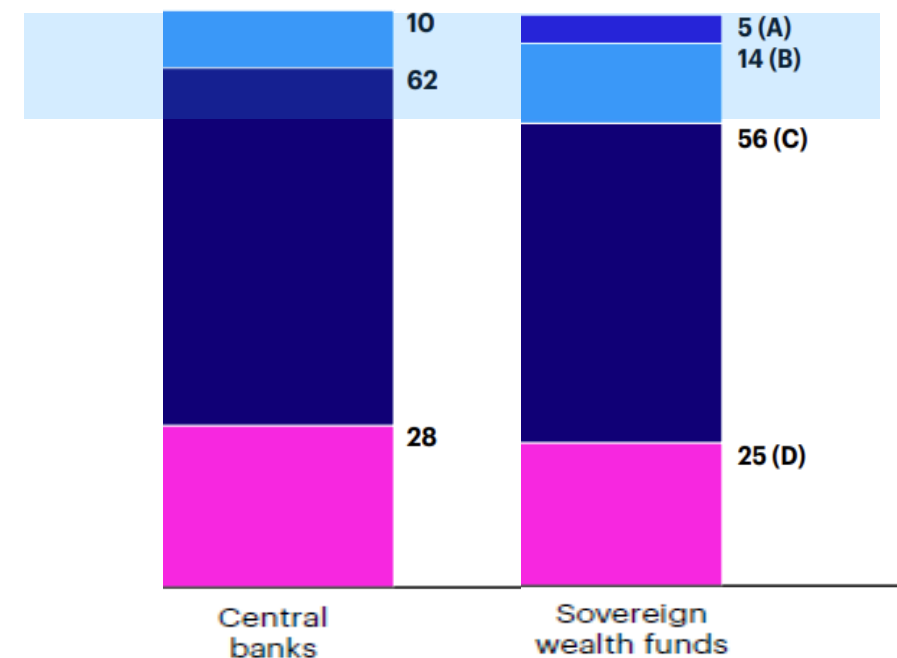
How public investors embrace AI

Deployment of AI within Investment Processes
(% citations, CBs and SWFs)



- Yes, extensively (A)
- Yes, limited use cases so far (B)
- Considering applications, but not implemented yet (C)
- No, we do not currently use AI (D)

Impact of generative AI on Investment Processes
(% citations, CBs and SWFs)

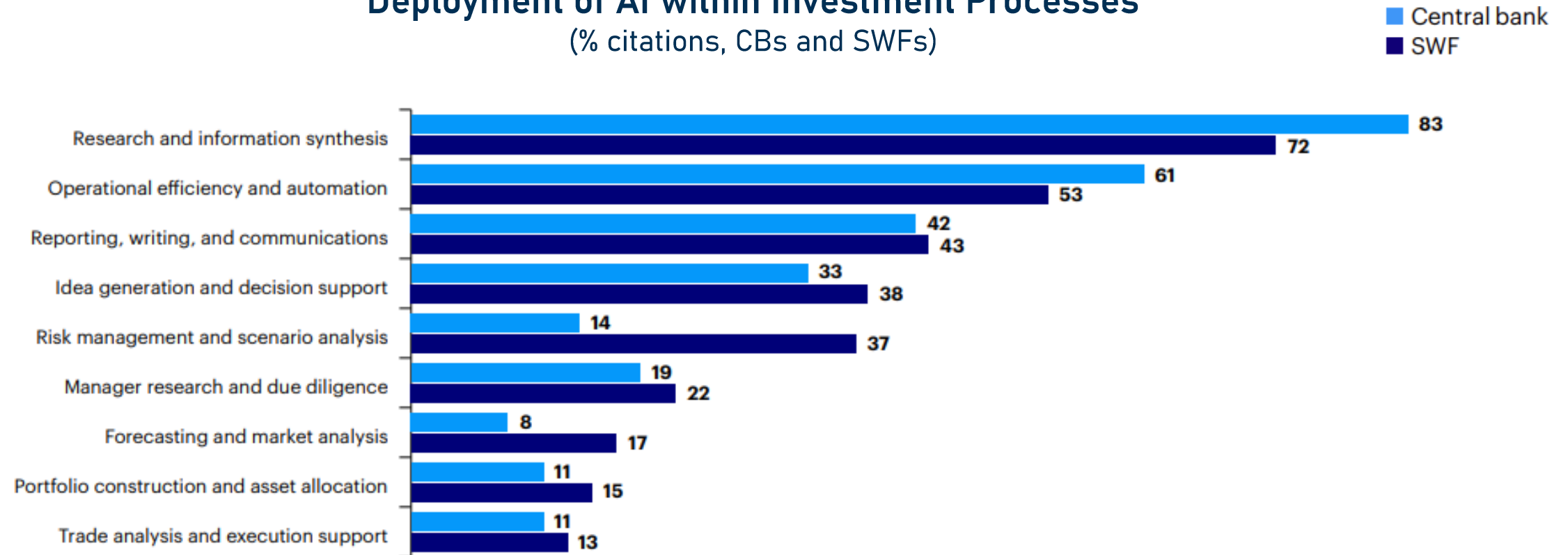


- Transformational change – generative AI is reshaping our investment process (A)
- Meaningful change – generative AI has altered how some investment decisions are made (B)
- Incremental change – generative AI has mainly improved efficiency or research (C)
- No material change (D)

How public investors embrace AI – processes

Deployment of AI within Investment Processes

(% citations, CBs and SWFs)

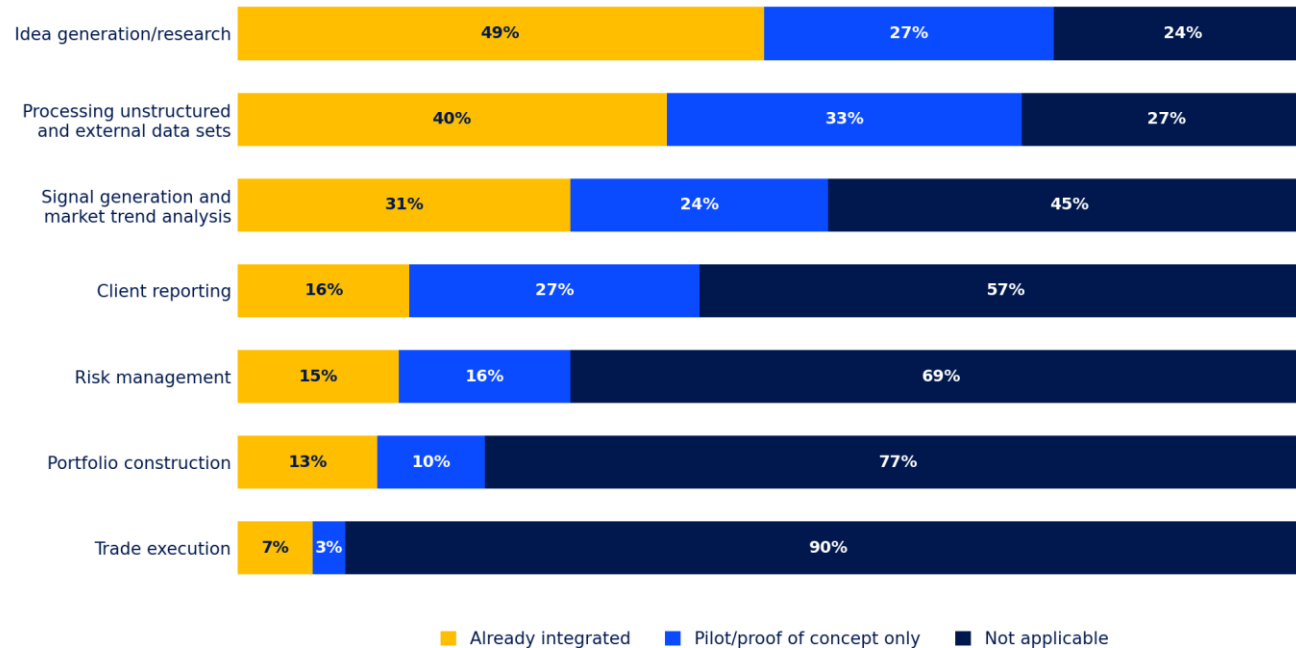


Which parts of your investment process do you currently use AI for? Sample size: 118.

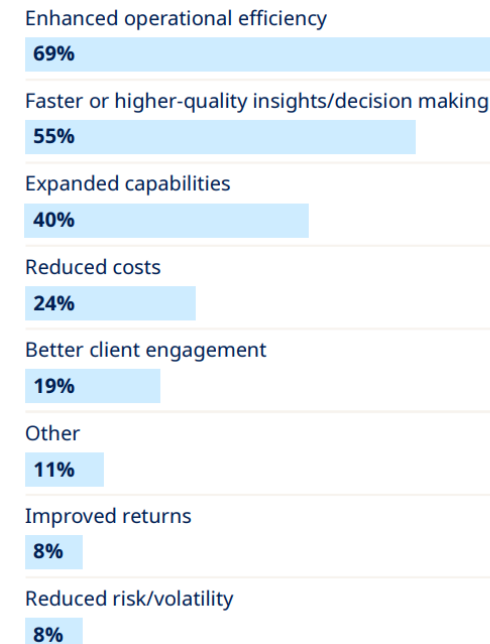
Source: Invesco Global Sovereign Asset Management Study (2026)

How are asset managers integrating AI?

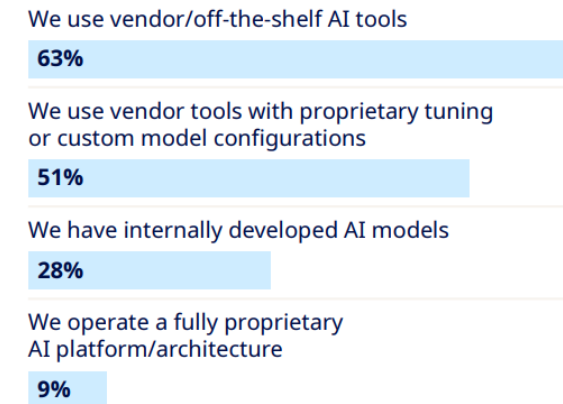
- Asset managers are in an active early-adoption phase with AI
- AI is being used predominantly to seek improvements in productivity and augment human decision-making



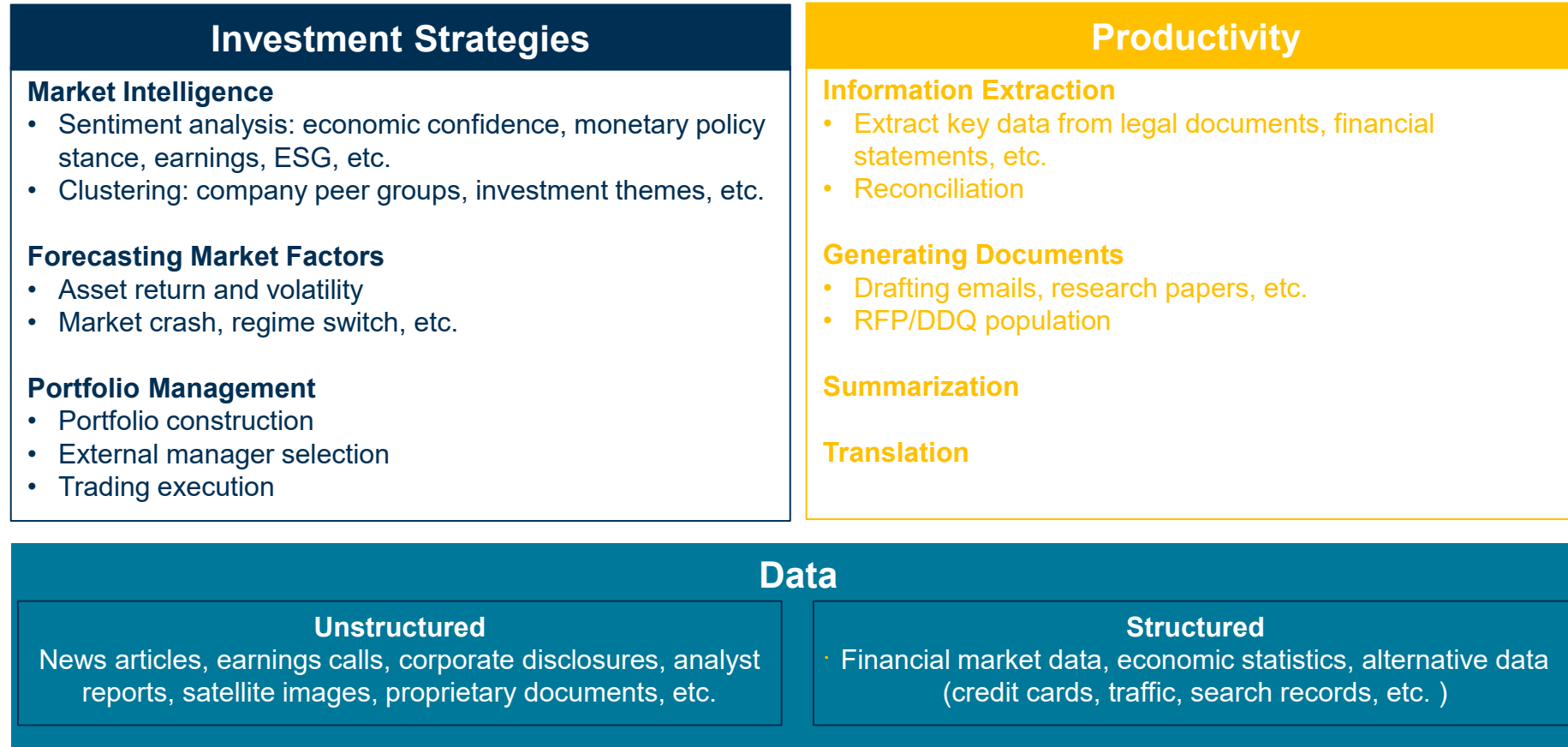
Benefits observed from AI Integration



Nature of AI Capability



AI applications for Institutional Investors



AI as a team member

Human-AI Partnership in the Investment Process

Investment Stage	AI contribution	Human contribution
Idea Generation	Analyze vast amounts of research, filings, news and market signals	Define investment priorities and select promising opportunities
Research & Analysis	Process data, build models, identify patterns and comparables	Challenge assumptions and interpret context
Investment Decision Support	Draft investment cases, summarize arguments, identify risks	Exercise judgment and make final decisions
Portfolio	Monitor exposures, run stress tests, flag anomalies	Set risk appetite and determine portfolio actions
Continuous Monitoring	Track developments 24/7 and generate alerts	Decide when and how to respond

AI and central bank functions - BIS

- Monetary policy
 - Macroeconomic analysis such as nowcasting inflation expectations and GDP real time, BIS Central Bank Language Models
 - Supervision and financial stability
 - ECB's platform Aetna – sentiment analysis using NLP for regulatory documents and finding trends
 - Federal Reserve's Lex – supervisor's access to relevant information from millions documents
 - Central Bank of Brazil's Adam – using neural networks to identify borrowers' credit worthiness
 - Payment Systems
 - BIS project Aurora – machine learning models to capture money laundering data
- ➔ Significant challenges include the black box problem, data privacy and legal issues, and overdependence on a few external vendors



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Challenges and responsible AI framework

Trustworthy AI starts with trustworthy data

- Data Governance Principles As A Cornerstone

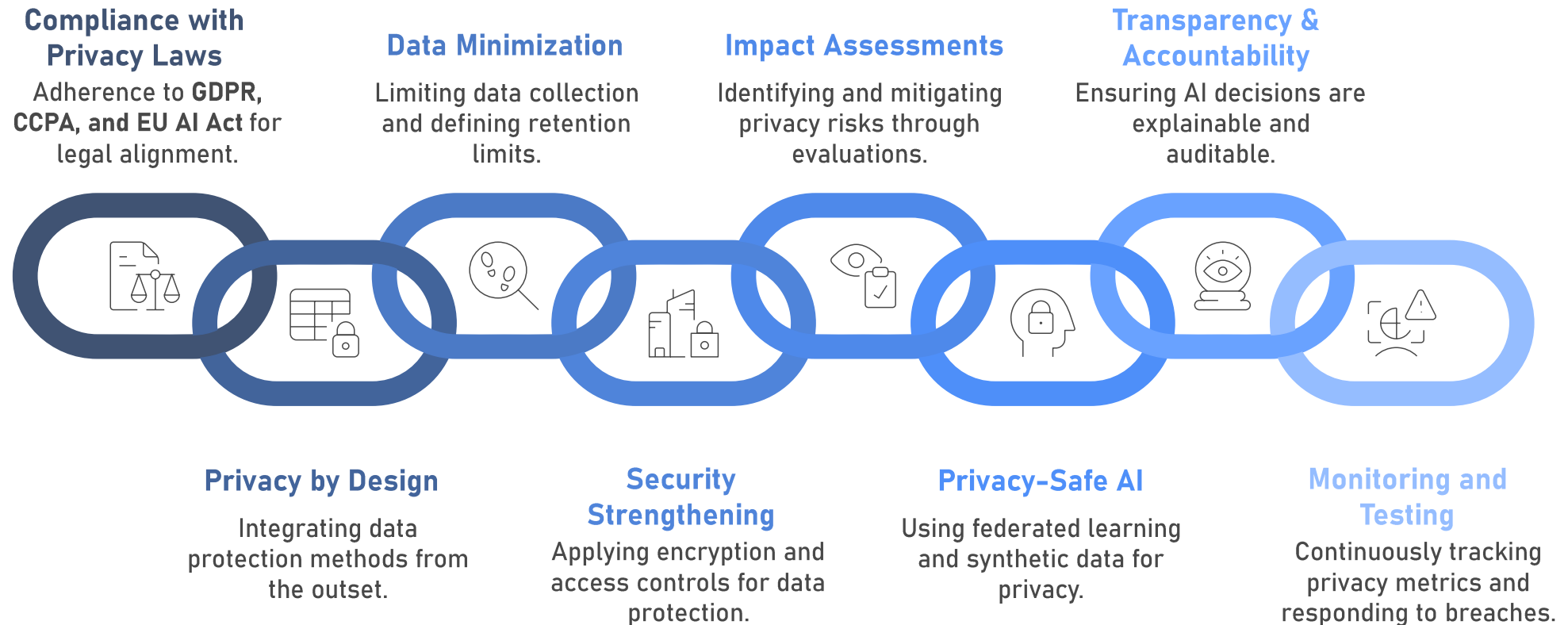


Reference Materials & Tools

- **Regulations:** GDPR, CCPA, HIPAA, AI Act (EU), local digital sovereignty laws
- **Frameworks:** ISO/IEC 38505, NIST AI RMF, OECD AI Principles, DAMA DMBOK
- **Tools:** Data cataloging, lineage tools, AI explainability frameworks, security information event monitoring (SIEM)

Foundations of ethical data use in AI

- The responsible, ethical, and lawful handling of personal and sensitive data that AI systems collect, analyze, and act upon



Safeguarding AI systems against digital threats

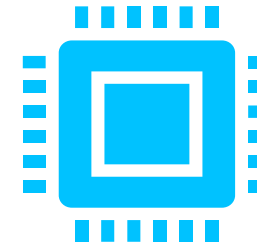
- Ensure AI is secured against cyber-attacks and complies with relevant laws



Cybersecurity & IT Risks

AI as a New Attack Vector

- **Data Poisoning:** Malicious actors can manipulate AI training data, leading to misleading financial insights.
- **Prompt Injection Attacks:** Cybercriminals can exploit weaknesses in generative AI systems.



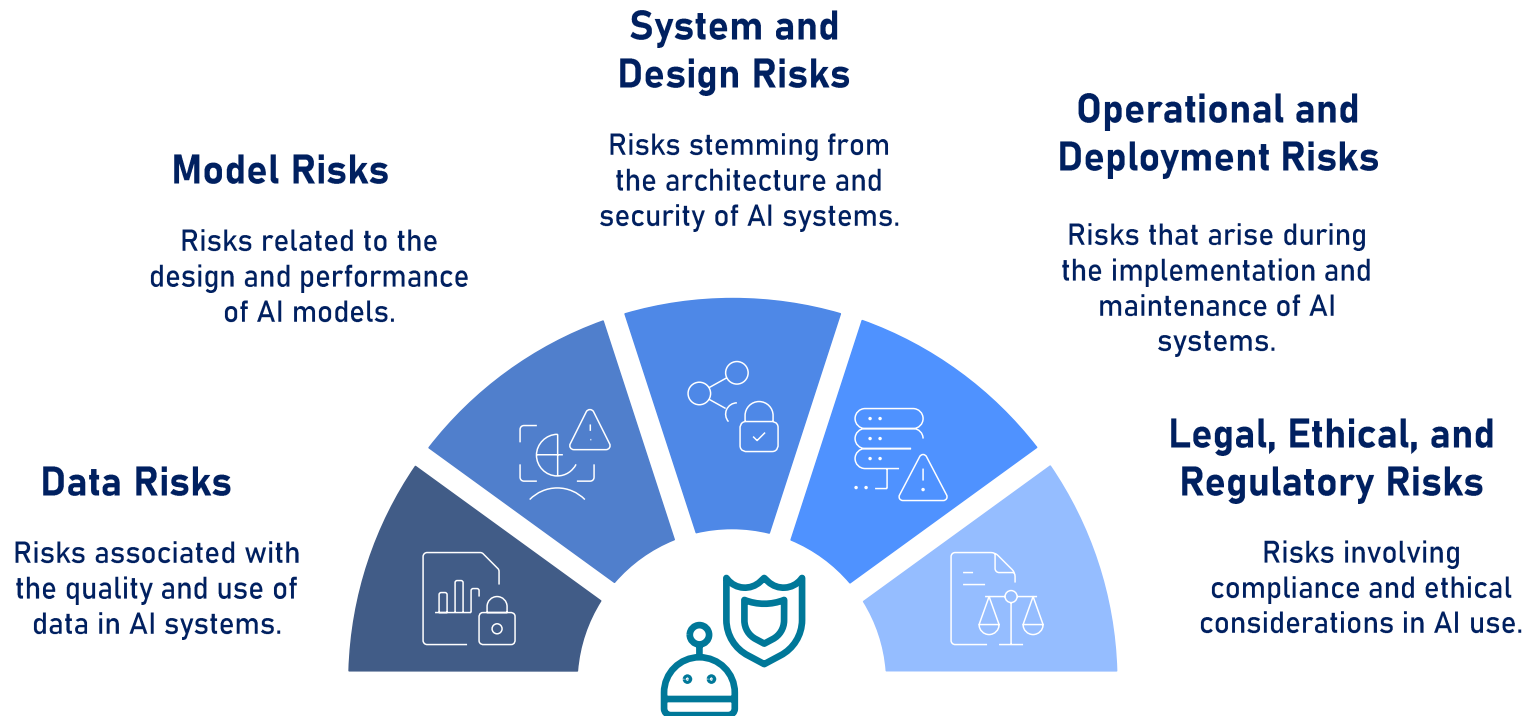
Strengthen Cybersecurity Controls

- Implement real-time monitoring for AI security vulnerabilities.
- Adopt ISO 27001 and NIST cybersecurity frameworks to secure AI-driven systems.
- Leverage frameworks for MITRE ATLAS™ to identify and evaluate security risks

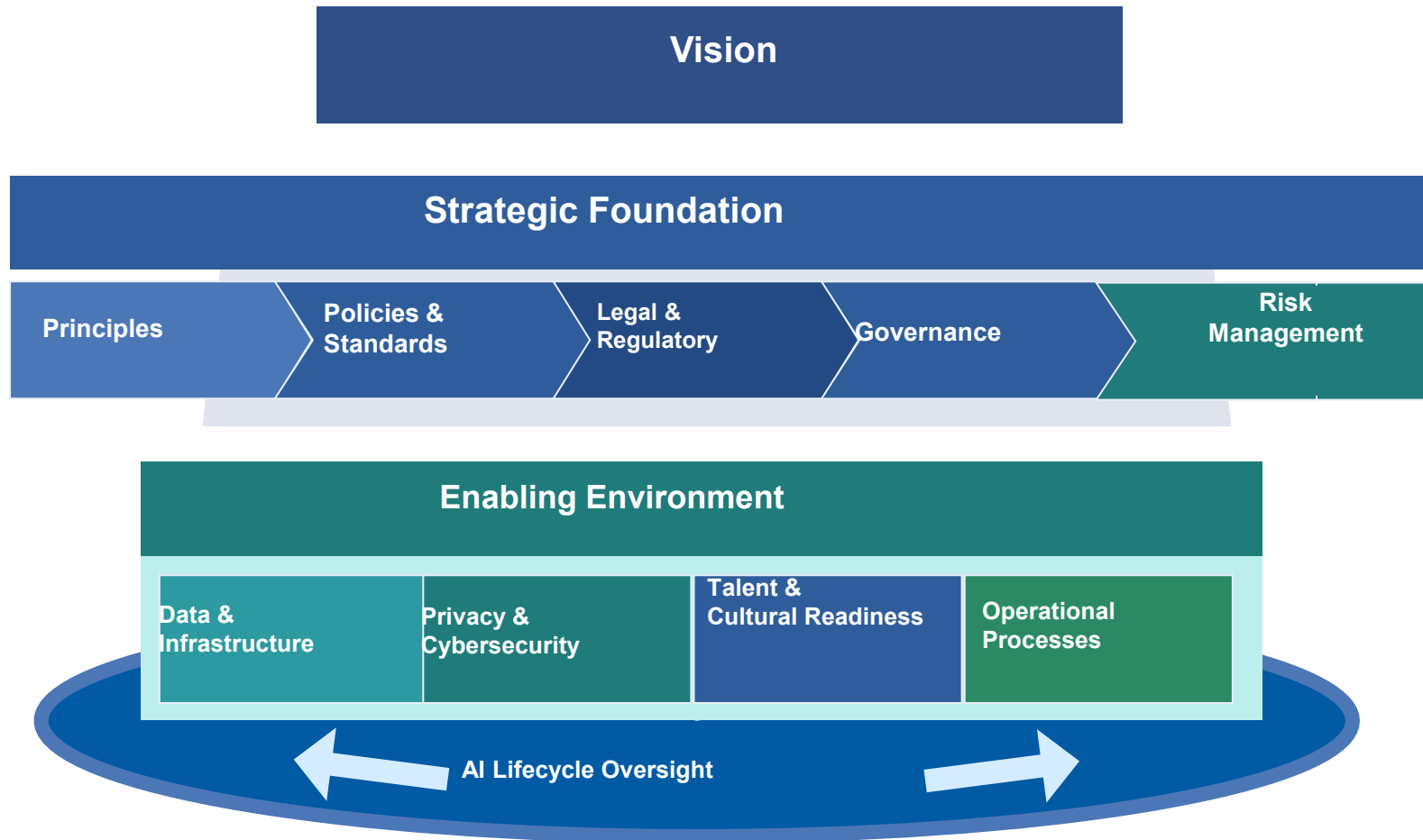
AI risk management

- Integrate AI Risk Management into the organization's enterprise risk management framework

AI Risk Framework

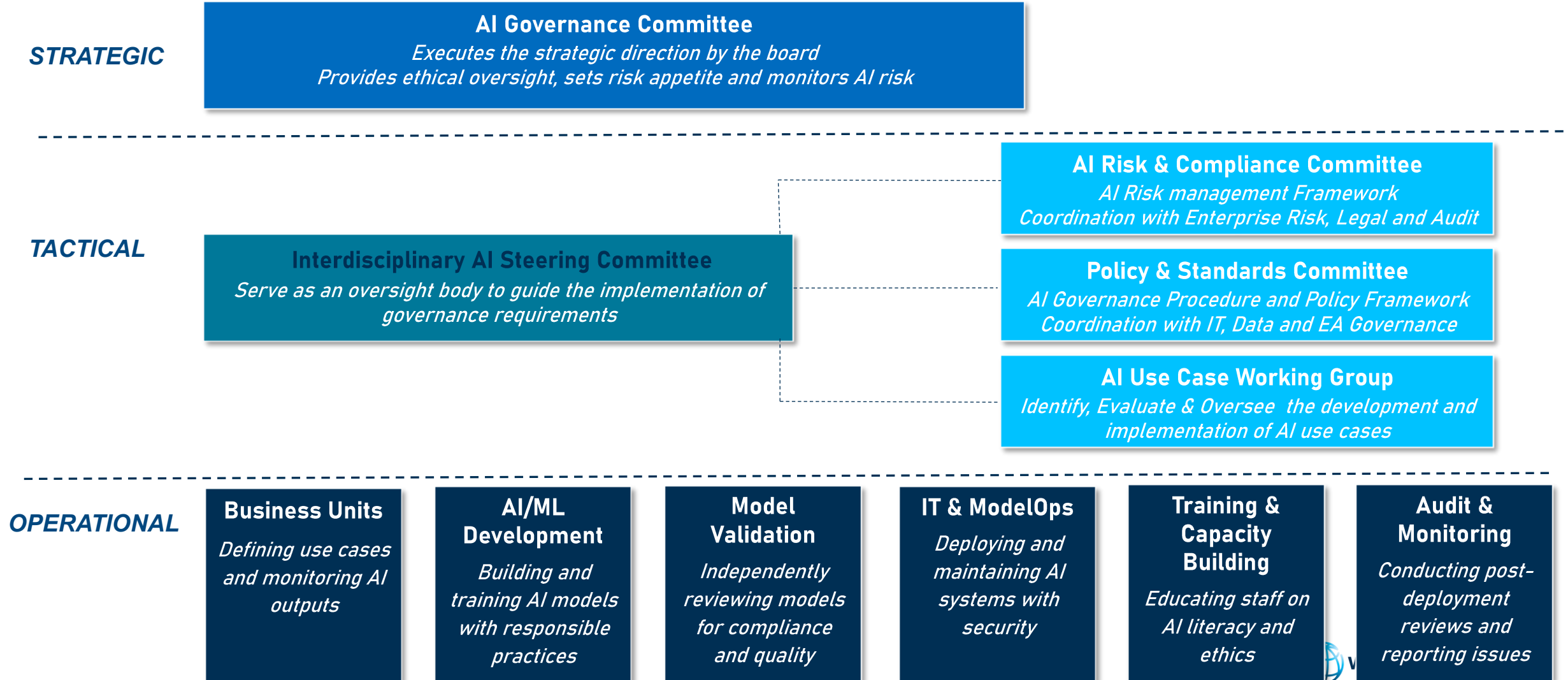


Framework for responsible AI adoption



Aligning AI governance

specify which committees or functions review, approve, and monitor AI initiatives at each level.



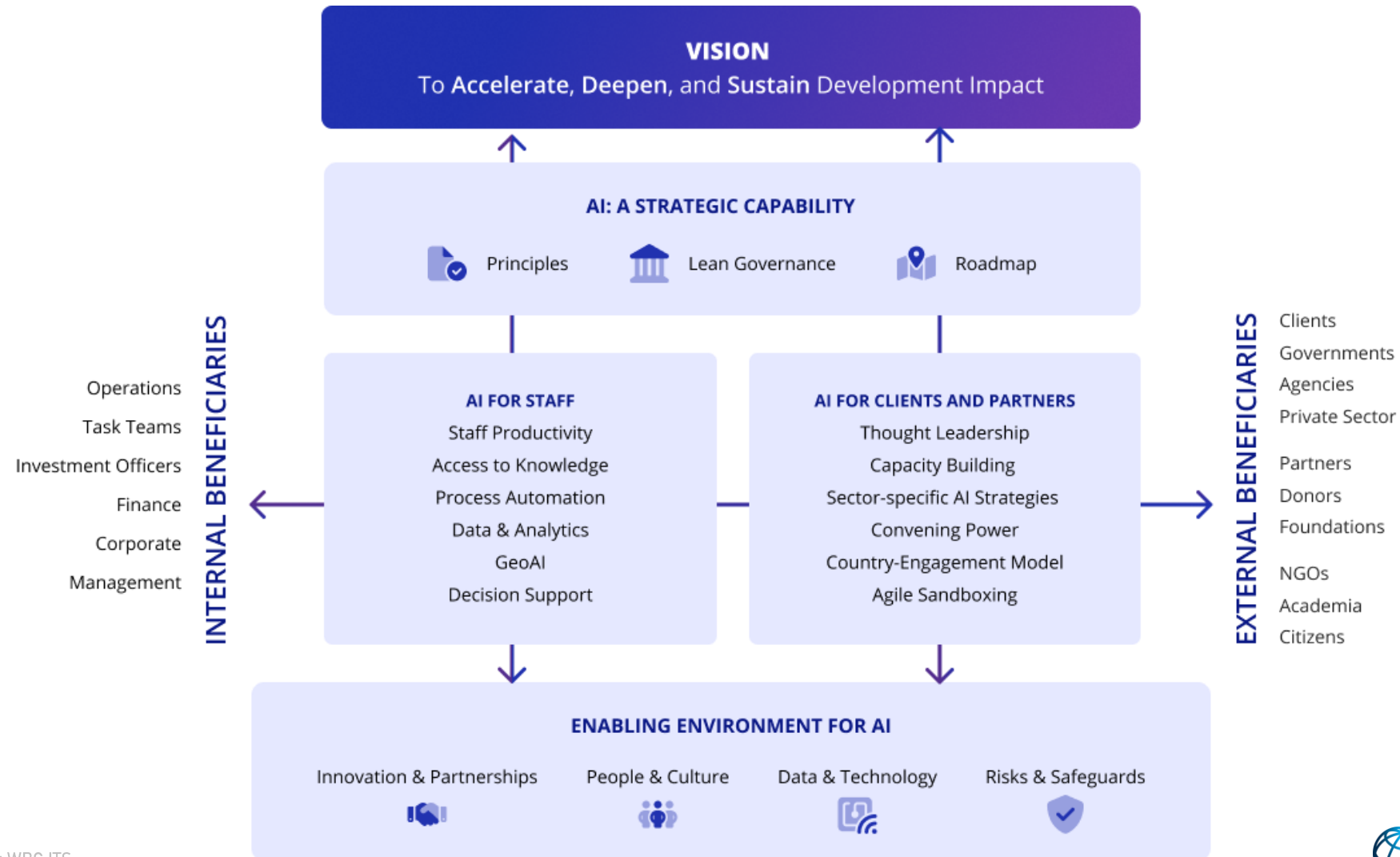


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World Bank Group's perspectives on AI

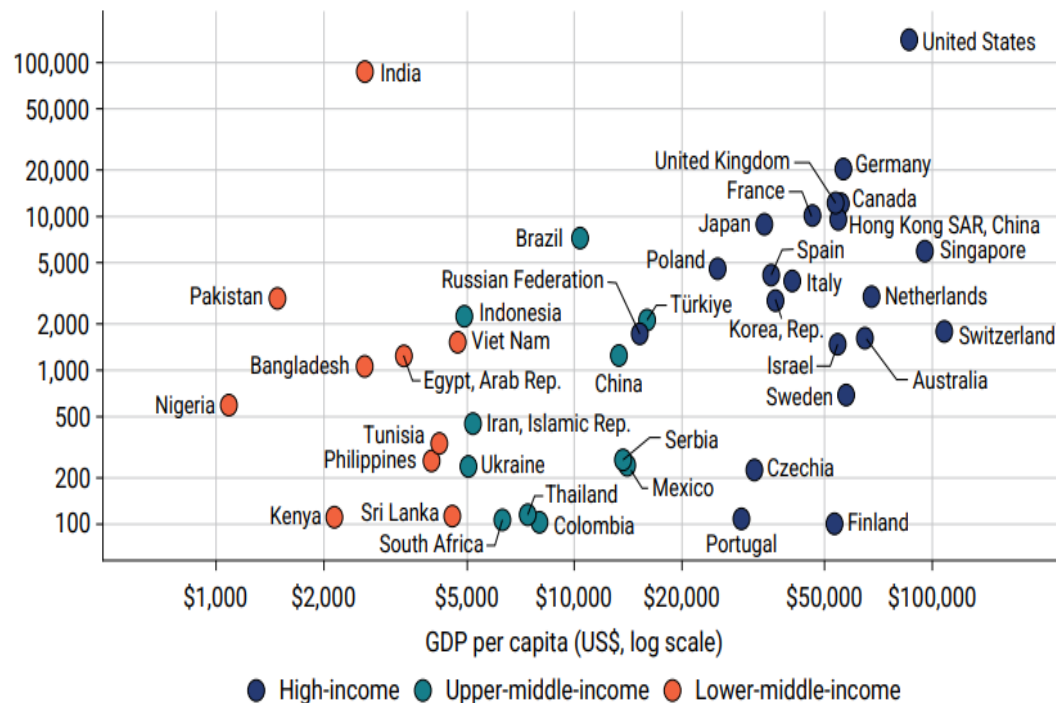
World Bank Group AI framework



Why AI matters for development

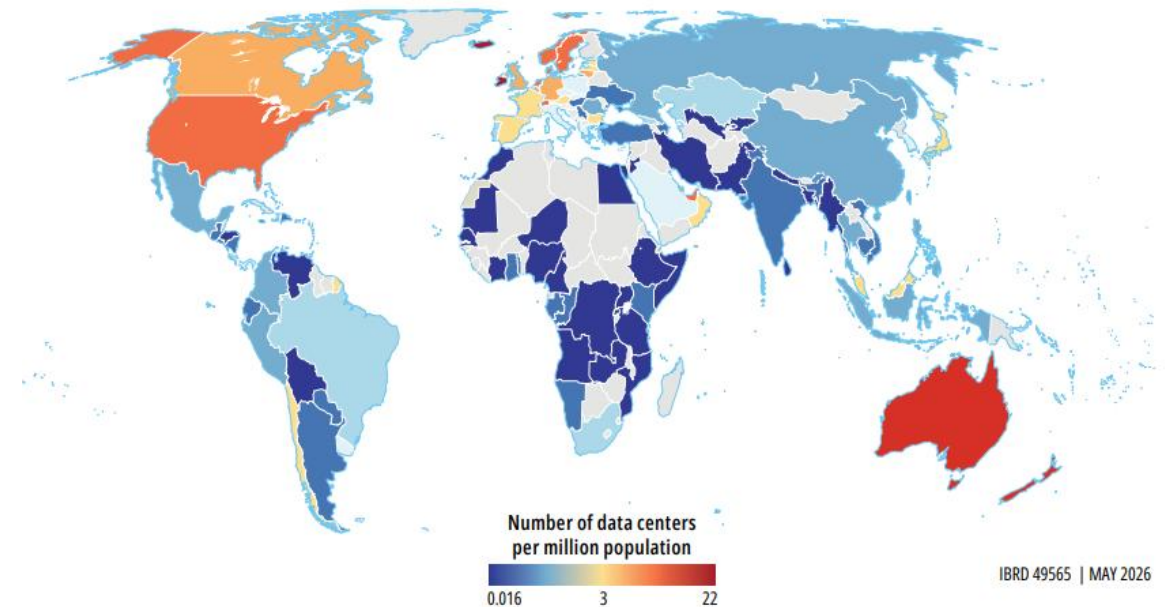
AI-related activity on GitHub in middle-income countries trails that in high-income economies only slightly

Number of AI pushes (log scale)



Source: The promise of AI, A World Bank Group Flagship Report(2026)
 , based on Git Pushes (dashboard), Innovation Graph, GitHub, <https://innovationgraph.github.com/global-metrics/git-pushes>; WDI (World Development Indicators) (dashboard), World Bank, <https://datatopics.worldbank.org/world-development-indicators>

Data centers are concentrated in developed countries



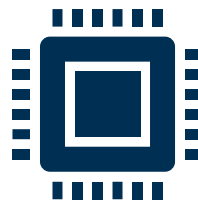
Source: The promise of AI, A World Bank Group Flagship Report(2026)
 Note: The policy recommendations for adapting and advancing AI solutions are qualitatively similar but quantitatively different. For example, investments in computing infrastructure, data, and AI-related technical skills are significantly larger in AI advancement relative to AI adaptation. AI = artificial intelligence.

The three Cs framework



Capabilities

- AI alleviates shortage of expertise
- AI performs complex cognitive tasks



Concentration

AI models, chips, and infrastructure remain concentrated in a small number of countries and companies



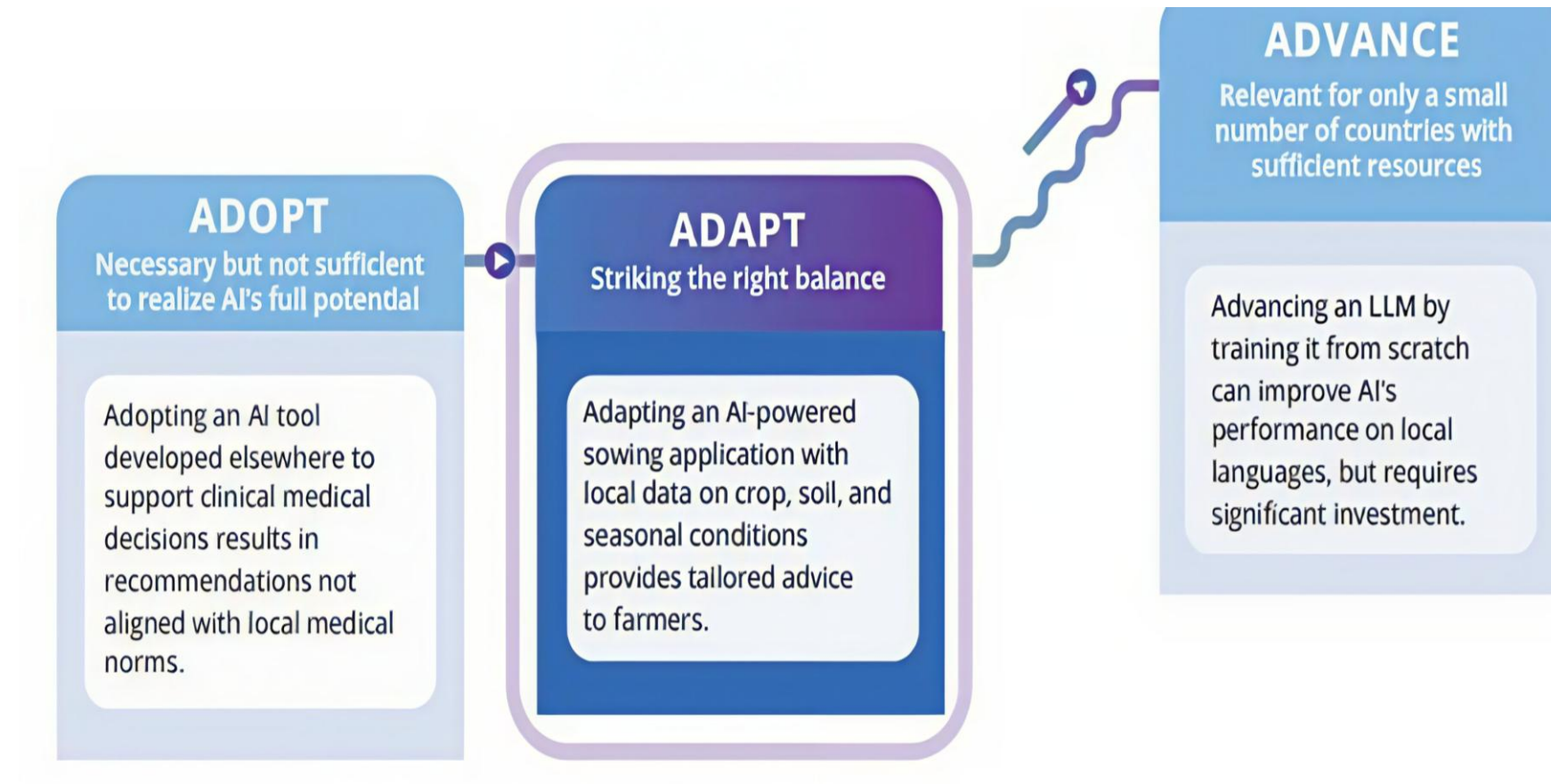
Dependency Risks



Complement

Infrastructure, education, digital access, data quality, and institutions determine whether AI creates value

Key recommendation: Adopt and Adapt AI



Source: The promise of AI, A World Bank Group Flagship Report(2026)

AI use cases in World Bank Treasury

Project ASTRA or AI for Securities Terms Reconciliation & Analysis

Using AI/ML to instantly reconcile bond term sheets between Bloomberg data and internal trade records

Gen AI for Bank Health Monitoring

AI-driven model for monitoring banking partner health, including alerts, forecasting, ad hoc threat analysis

AI/ML for Intelligent Document Processing

Prototype solution to efficiently extract guidelines from client's investment management agreements

Agentic AI Use Cases Exploration



At the World Bank, finance and treasury functions deal with complex workflows and require real-time insights, often involving manual effort. The rapid advancement of **Agentic AI** offers new ways to improve efficiency and decision-making in financial operations.

Partnering with **Microsoft innovation team**, we are exploring advanced AI applications in finance through **problem-framing sessions** and a **rapid prototyping sprint**, aimed at identifying AI use cases for increased operational efficiency.

AI/ML for FinTech News Sourcing

Prototype solution to assess curated FinTech related news on digital asset/money with sentiment insights

AI/ML for Business Continuity News Sourcing

Prototype solution to track news impacting Treasury business continuity, including weather, staff safety, and cyber incidents

AI for News Sourcing Treasury-wide use cases

Consultancy study to scope/build a unified AI-driven news sourcing platform to enhance data gathering process across Treasury units

Key takeaways

AI Adoption is imperative – for all institutions

- The value of AI ultimately depends on how well it is embedded within strong institutional foundations.

Prioritization over proliferation

- Effective adoption includes prioritizing use cases that are scalable, relevant, and aligned with institutional needs, rather than pursuing initiatives driven by external demands.

Building the foundations for responsible AI adoption

- Governance, risk management, and operational processes must evolve in parallel with AI adoption.

Balancing opportunities and challenges

- Evolving regulatory expectations will continue to reshape how AI can and should be deployed.

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