

Artificial Intelligence in Investment Banks

How can banks realise value from artificial intelligence?

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AI brings forth the Dawn of the Fourth Industrial Revolution

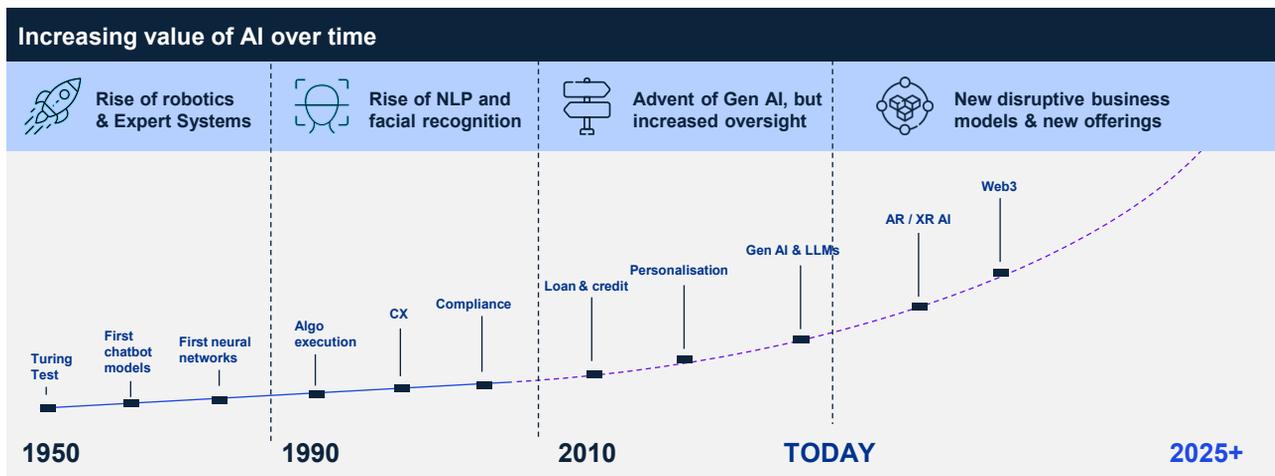
Although AI has been prevalent over several decades, there have been increased headlines in the past year, due to the potential impact across multiple industries. The benefits are profound for financial markets, and banks that best leverage their data will be well placed to differentiate from peer groups and reap rewards.

ChatGPT and other Generative AI (Gen AI) have disrupted the market with new use-cases, but firms must deploy the use-cases through a robust risk framework to ensure trust with their clients.

Banks are at various stages in their AI adoption journey, with some deploying 100+ models in production already. However, we are seeing increasing review of AI use cases, and most of the firms are now including AI within their book of work next year



Feargal De Burca
Partner, FS Transformation



What does Gen AI now mean for banks?

Gen AI is now considered the top 3 emerging technology over next 12-18 months¹, with 60% of executives state that they are 1-2 years away from implementing their first generative AI solution². Although traditional AI techniques were already driving innovation and improving efficiency, Gen AI can now better complement the banks' everyday tasks.

It is, however, worth noting that traditional AI models may still be better suited in certain cases. Firms should consider not only the outputs, but the use-case, and data inputs whilst selecting the appropriate models. In addition, there are key limits with Gen AI when compared to new traditional AI techniques such as: (i) lack of transparency ("black box"), (ii) accuracy ("hallucination"), and (iii) prompt injections.

Applications	AI Adoption Scale (1-10)									
	1	2	3	4	5	6	7	8	9	10
Content Summary				●						●
Conversational knowledge	●									●
Content creation		●								●
Code creation	●									●
Structured data prediction		●								●
Anomaly detection				●					●	
Sentiment Analysis								●		●
Natural Language Inference								●		●
Classification					●					●
Robotic process automation								●		●
Deep learning							●			●
Digital twins	●						●			

^{1,2}2023 KPMG Generative AI Survey Report



We are at a market inflection point for AI



Market Drivers

There are various market forces driving AI in the spotlight that makes it a compelling prospect to investigate AI adoption



DATA

90% of firms' data is in an unstructured format. AI helps firms leverage internal big data and gather market and client insights in real-time through Gen AI.



AUTO ML

Large firms such as Google and Microsoft now provide end-to-end ML deployment frameworks, reducing dependency on data scientists.



COMPUTE

Compute power has leapfrogged over the last few years, with the advent of GPUs. This will only increase with Quantum computing hardware.



NEW TECH

Ability for LLMs to run models with over 100+bn data parameters



VENDOR SOLUTIONS

FinTechs now provide proven solutions that can be fine-tuned to firms' data and easily deployed on cloud or on-prem, accelerating time to market, with increased RoI.



INVESTMENT

Increased government funding – e.g. UK has pledged c£1bn on AI research & next generation of supercomputing.

[Government commits up to £3.5 billion to future of tech and science - GOV.UK \(www.gov.uk\)](https://www.gov.uk)



Impact

AI is forecasted to have a considerable impact, and will change the face of the banking industry, as we know it

70%

Increase in AI research papers published by banks per year from 2017 to 2022 (300+ in 2022 alone)

[Evident - Innovation Report \(evidentinsights.com\)](https://evidentinsights.com)

30%

Predicted volume of outbound messages from large firms that will be synthetically generated.

[Generative AI Use Cases for Industries and Enterprises \(gartner.com\)](https://gartner.com)

50%+

ROI from investments in AI tech

[KPMG US Technology Survey in 2022](https://kpmg.com)

£31bn

Gen AI could increase productivity by 1.2% in the UK

[Productivity boost from Generative AI - KPMG United Kingdom](https://kpmg.com)

12m Net

97mn new jobs created, with 85mn jobs displaced by 2025.

[3 'jobs of the future' that are already here | World Economic Forum \(weforum.org\)](https://weforum.org)



Transfer Learning:

In the early days of AI, models had an inability to learn from data outside its domain. This problem is being explored under the name of transfer learning. Transfer learning is **process of starting with a pre trained model and training it for a new problem domain**. The pre trained network serves as transferred knowledge.



Chief AI Officer:

There is a potential for the creation of a Chief Artificial Intelligence Officer (CAIO) role within the industry.



Regulation:

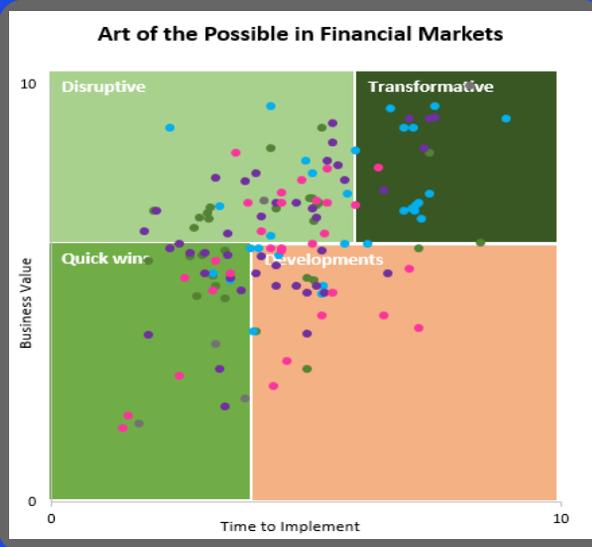
There will be increased focus from government and stakeholders to build trust on use of AI responsibly, and ensure compliance with existing and future laws.



Increasing applications of AI within investment banking

As AI technology evolves, new applications will be discovered. Based on current market challenges and our insights, we have identified over 150 use-cases which would benefit investment banks across all functions. These use cases look at using: i) Automation, ii) Sentiment Analysis, iii) Optimisation, iv) Personalisation and v) Gen AI.

Firms can derive value now with low investment, but should also start thinking about long-term transformation to become true market leader



- Use-cases breakdown:**
- Front Office: 60+
 - Middle & Back-Office: 45+
 - IT: 10+
 - Risk: 15+
 - Legal: 5+
 - Compliance: 25+
 - HR: 10+
 - Change Mgmt: 10+

- Key:**
- Automation
 - Gen AI
 - Sentiment Analysis
 - Optimisation
 - Personalisation

Benefits Tracking



Monetise Data: Get real time insights on customer and market



Resource: Deploy resources more intelligently in value adding services



Time Saving: Automate manual or repetitive processes incorporating dynamic rules or policies

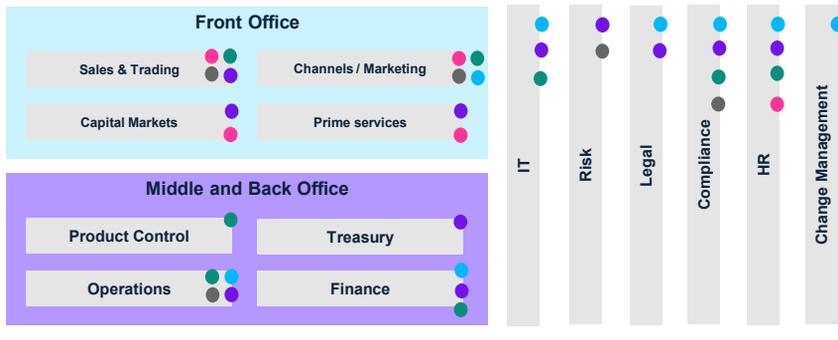


Risk Reduction: Minimise human errors with more accurate processing and thus reduce compliance risk



Customer Experience: Enhance relevance through personalised service and retain key clients

Indicative Operating Model of Investment Bank



Existing solutions already provide tangible business benefits, but there is scope for more...

- Gen AI is very much in PoC stage, with its immense potential still unknown. However, with increased adoption, AI will become indispensable and key staple for all personas and stakeholders.
- Race to recruit talent, innovate, research and invest will only continue to increase, not only by banks, but by universities, research players, technology houses and the Government.
- New data sets will continue to be identified, which will be the cornerstone for new insights.
- Rol for AI projects will increase as firms achieve increasing economies of scale.

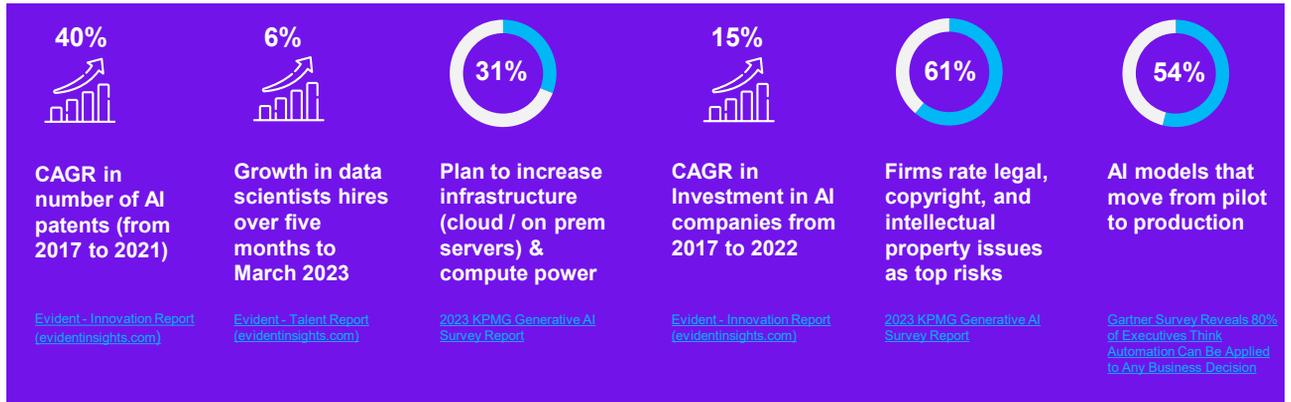
Most banks have already started looking to prioritise adoption based on their strategic priorities, but should also align against their internal capabilities (such as talent, budget) – a key question banks need to address is the extent of “buy vs build” to accelerate adoption.



Call to Action

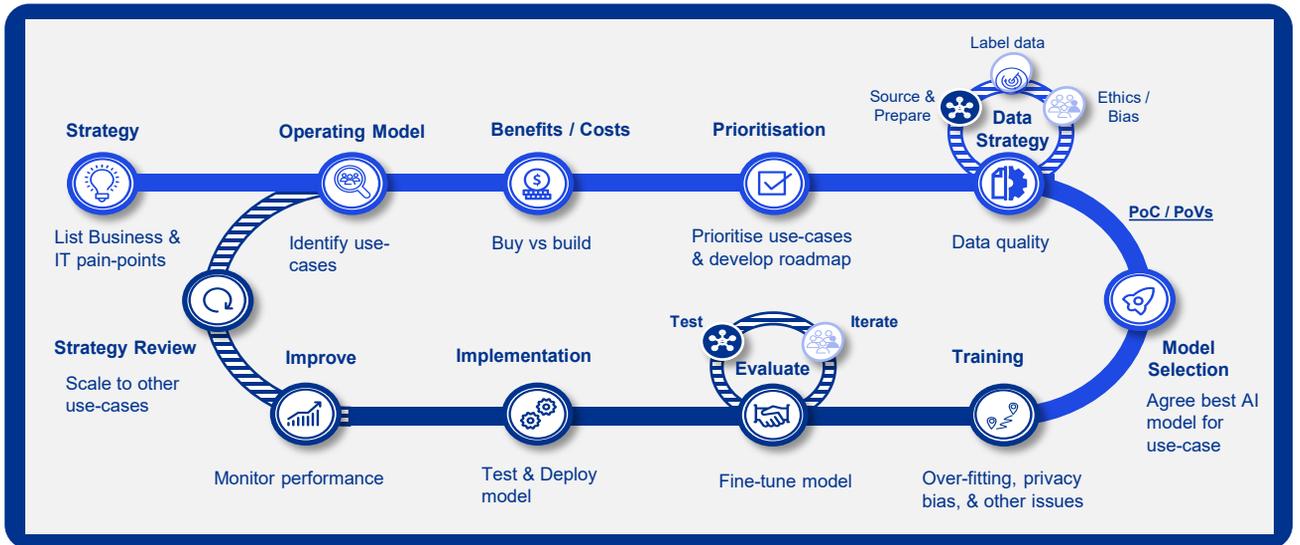
Banks must have a fully fledged AI adoption playbook to execute their strategies. They must consider not only the predictive output and value derived from AI to their business and working practices, but also data quality, bias, and regulatory impact of applying these models. It is imperative for firms to identify risks associated throughout the AI journey to ensure that appropriate mitigating steps are in place from onset.

Over the past year, we have seen the following trends in the banking industry:



How should banks adopt AI in their organisation?

Firms are at different stages in their AI maturity, however, we recommend our clients to document its strategy and develop a roadmap plan, before commencing on deploying AI models, as per below



Four steps to getting off on the right foot:

- 1. Use-Case PoV**

Identify use cases across your business

Prioritise based on balance of business value, risk and strategy alignment
- 2. Operating Model**

Understand maturity of your organisation with regards to people and process

Identify gaps and design a target operating model
- 3. Infrastructure**

Assess robustness of your infrastructure

Review ability to deploy AI models internally

Market scan of partners that can boost your RoI, with proven use cases
- 4. Risk Management**

Develop your risk management framework to develop and deploy AI models

Create KPIs to continuously monitor for performance



Key risks and pitfalls to avoid in your AI journey

Key Risks	Description	Example Mitigating Actions
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Strategy and Operating Model

Stakeholders buy-in	<ul style="list-style-type: none"> Lack of consensus, documentation or strategy to implement AI 	<ul style="list-style-type: none"> Articulated design principles and End State Internal strategic alignment and pain-points of clients
Talent	<ul style="list-style-type: none"> Limited talent pool of data scientists 	<ul style="list-style-type: none"> Invest in upskilling staff, use of low-code solutions
Infrastructure	<ul style="list-style-type: none"> Infrastructure not fit for purpose Systems not robust or scalable 	<ul style="list-style-type: none"> Enhance infrastructure, or integrate third-party solutions that connect with legacy applications
Data Quality	<ul style="list-style-type: none"> Current data will not be complete, accurate or consolidated as needed 	<ul style="list-style-type: none"> Review data, document gaps & use other data sources Access & entitlements checks

Benefits / Costs

Financial	<ul style="list-style-type: none"> Business case not articulated clearly Benefits and costs to transition and run not clearly defined or communicated 	<ul style="list-style-type: none"> Identify pain-points to derive best business value Use sector best practice, to ensure the cost and benefit estimates are accurate
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Prioritisation

Roadmap	<ul style="list-style-type: none"> Lack of consensus across stakeholders on next best steps 	<ul style="list-style-type: none"> Quantitative framework to score use-cases based on business value, build complexity, risks and op model
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Data Strategy

Ethical	<ul style="list-style-type: none"> Data bias - gender, post-code, etc. 	<ul style="list-style-type: none"> Defined guardrails on risk parameters and guidelines in line with firm policies
Regulatory / Legal	<ul style="list-style-type: none"> Compliance with internal policies such as liability clauses or external rules such as EU AI Act or GDPR 	<ul style="list-style-type: none"> Risk assessment on models against policies and regulation On-board models in line with regulatory and legal rules

Model Selection

Intellectual property	<ul style="list-style-type: none"> Possible disputes on ownership of IP, including when multiple parties participate 	<ul style="list-style-type: none"> Clear contract and T&Cs Document patents
Explainability	<ul style="list-style-type: none"> Inherent "Black Box" to understand and explain its internal reasoning on output 	<ul style="list-style-type: none"> Outputs providing features rationale Model documentation or technical details
Data Privacy	<ul style="list-style-type: none"> "Right to erasure" not compatible in certain models, especially LLMs 	<ul style="list-style-type: none"> Use of synthetic data Identify PII in training data, & apply possible masking
Model Risk	<ul style="list-style-type: none"> Models do not behave as designed or intended 	<ul style="list-style-type: none"> Continuous risk monitoring across model lifecycle Accurate registry of all models

Training and Evaluate

Accuracy / Hallucination	<ul style="list-style-type: none"> Incorrect model output End-to-end architecture not developed 	<ul style="list-style-type: none"> Robust Model validation and training framework Test for over-fitting
Bias / Discriminate	<ul style="list-style-type: none"> Human bias can be weaved into model or training data 	<ul style="list-style-type: none"> Detect features in training data viewed as discriminatory Sentiment analysis on prompt or model responses
Environment	<ul style="list-style-type: none"> Increasing demand for computing power & storage can have a significant ESG impact 	<ul style="list-style-type: none"> Transparency on possible impact, with use of other efficient energy consumption

Full Implementation & Improve

Ownership	<ul style="list-style-type: none"> Generate unexpected and unintended consequences or new forms to be addressed 	<ul style="list-style-type: none"> Use PoC/PoVs prior to deployment End-to-end AI governance for oversight Centralised tools and framework, with full audit trials
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Review

Return on investment	<ul style="list-style-type: none"> Multiple AI models in production creates governance issues to demonstrate RoI across each model 	<ul style="list-style-type: none"> Meta data across each models Lessons learnt to decrease economies of scale User Education & Adoption
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How has KPMG helped banks accelerate AI adoption?

Transformation enabled by AI requires business-wide collaboration across functions, processes and people. KPMG, in conjunction with our alliances and partners, are delivering leading-edge solutions that are critical to meet your clients' growing needs.

 Strategy & Operating Model	 Data Integration	 Model Build & Review	<p>01 Improve functional performance Our goal is to enable investment banks to become a more future focused enterprise, ready to drive growth.</p> <hr/> <p>02 Manage trust through robust risk framework Our trusted solution offerings help clients proactively manage risk and regulation, from compliance and operationalisation across the transformation cycle.</p>
 Technology Assessment	 Infrastructure	 Risk & Compliance	

<p>Strategy & Operating Model</p> <ul style="list-style-type: none"> • New business models • Peer insights • People & culture • Governance & Design • Business Change Roadmap 	<p>Data Integration</p> <ul style="list-style-type: none"> • Data Lineage & Quality • Data Warehousing • API • Functional Testing • Synthetic data 	<p>Model Build & Review</p> <ul style="list-style-type: none"> • Data scientist for Model Validation, Model build • Data labelling • Deep Learning, neural networks, LLM
<p>Technology assessment</p> <ul style="list-style-type: none"> • Vendor selection – market insights • Use-case identification • PoC / PoVs • Business case • Implementation support 	<p>Infrastructure</p> <ul style="list-style-type: none"> • Operational resilience • Cyber • ML Ops • Cloud • Interoperability with legacy apps 	<p>Risk & Compliance</p> <ul style="list-style-type: none"> • Responsible AI, including bias, social, data privacy • Model review • Reg compliance (EU AI Act) • Internal policies compliance

KPMG are already using AI to deliver sustainable and effective change for our clients, helping them take advantage of AI, while becoming more resilient and secure.

We have deployed numerous new solutions and enablers, including managed services to achieve tangible cost reduction, improved client relevance and higher customer benefits.

Expert data scientists, data analysts, with deep experience in regulations, operating model	Alliances with Google and Microsoft, with early access to environments and 15+ emerging FinTech firms	Specialised model building toolkits and accelerators to anchor your objectives
Our extensive knowledge covers Strategy, ML Model, Data Quality & Integration	Regulatory Insights Centre which deep relationships with UK and international regulators to set gold standard	Proven Assets such as Use Case Inventory, Risk Framework, Risk & Control Standards and Business case documents

Ultimately, it takes people and technology working together to deliver sustainable and effective change. We combine our industry expertise, business know-how and risk, compliance and security knowledge with strategic AI technology partners and leaders to deliver solutions tailored to specific client needs.

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