

The Investment Bank of the Future: Trends in Technology and Innovation

Florence School of Banking & Finance
Online Seminar

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Agenda

1. Current industry context and challenges
2. Emerging technologies
3. The investment bank of the future
4. Considerations for banks and the industry ecosystem
5. Principles for innovation
6. Q&A

Current industry context and challenges

Investment banks continue to face significant challenges post the Global Financial Crisis



Regulation

- The long tail of regulations, with consequences on market structure, will still require investment in the coming years



Margin pressure

- Stagnant revenues
- RoE (return on equity) having been halved
- Continued market uncertainty
- Increased capital & funding constraints



Cost

- Cost to income ratios are high
- Significant “drag” of legacy systems and infrastructure, with high levels of technical debt and complexity
- Infrastructure complexity drives process inefficiency



Disruption & new entrants

- Business model and value chain shifts are disrupting traditional revenue channels
- Impact on M&A, IPO, Research, Sales/Trading



Macro economic & political trends

- Macro-economic stagnation
- Protectionism
- Climate change
- Socio-demographic shifts e.g. life expectancy

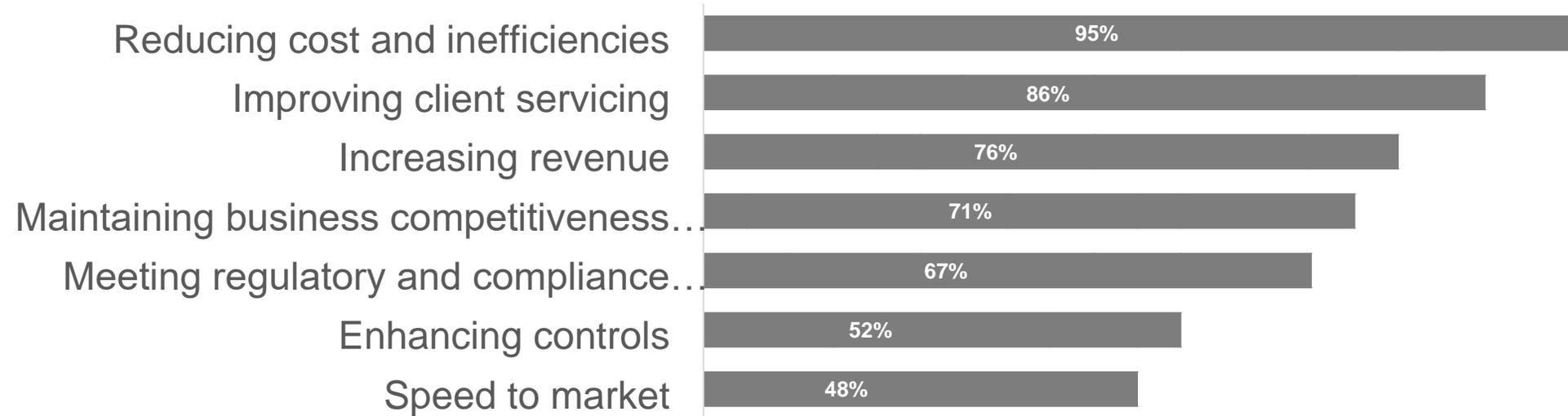
Poll question 1

What do you think will be the primary factor that will drive adoption of new technology in the industry?

1. Reducing cost and inefficiencies
2. Improving client servicing
3. Increasing revenue
4. Maintaining business competitiveness and agility
5. Meeting regulatory and compliance obligations
6. Enhancing controls
7. Speed to market

Poll question 1

AFME Survey Result



Emerging technologies

Technology is the most powerful lever banks have for addressing these challenges and delivering future opportunities. Four technologies in particular have the potential to transform banks and the industry ecosystem



Data & Analytics

- Encompasses the control and management of data assets, and the generation of insights from those data assets to improve decision making
- Core data assets include e.g. client data, product data, account data, employee data, transaction data, and position data.



Cloud

- 3 models:
- **Private; Public; Hybrid**
- Services:
- **IaaS** (Infrastructure-as-a-service)
 - **PaaS** (Platform-as-a-service)
 - **SaaS** (Software-as-a-service)



Artificial Intelligence

- Umbrella term for a number of algorithms and technologies that allow machines to simulate human intelligence by:
 - **Learning:** the acquisition of information, and rules for using the information
 - **Reasoning:** using the rules to reach approximate or definite conclusions and self correction



Distributed Ledger

- Combines database technology and cryptography where multiple participants each keep their own (distributed) copy of, and can update, records in a shared dataset.
- All copies remain consistent through computerised consensus mechanisms rather than through a trusted third party.
- Some of the most well-known DLTs are blockchains of which the Bitcoin blockchain is the longest established

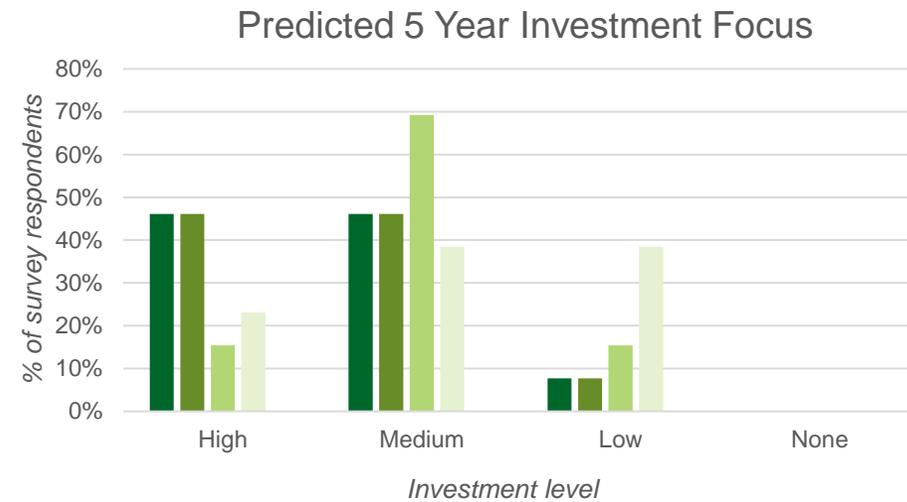
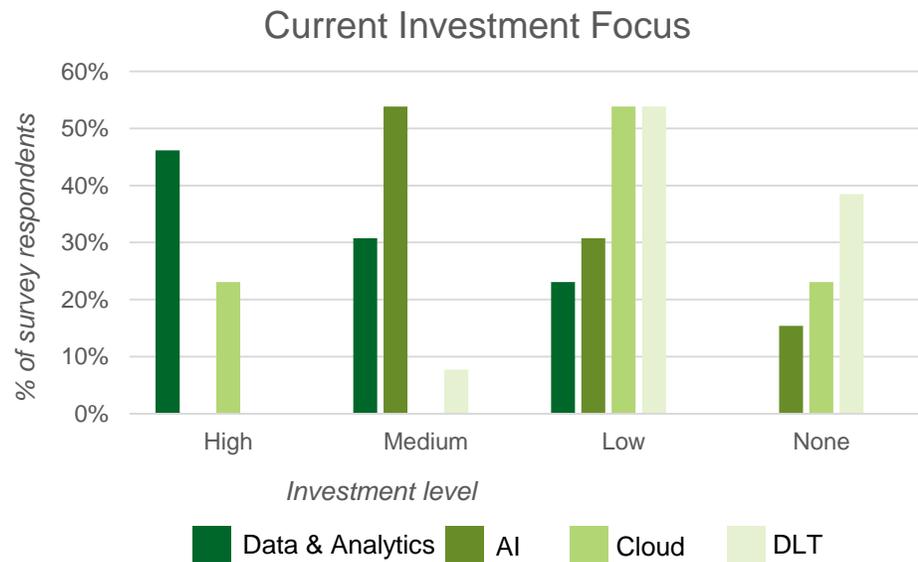
Poll question 2

Which technologies will be the focus of investment priority in 5 years?

1. Data and Analytics
2. AI
3. Cloud
4. Distributed Ledger Technology

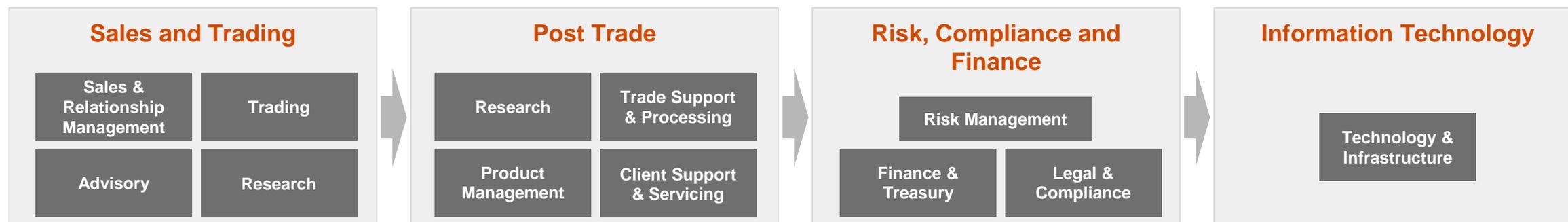
Poll question 2

AFME Survey Result



The investment bank of the future

Technology will have a significant impact on the investment banking value chain



Bank of the future

- Institutional clients will interact with the bank via open APIs and self-service digital portal platforms
- Near instantaneous client on-boarding via digital tokens to validate identity, allocated by a regulatory approved authority
- Significant automation of core front office activities, such as predictive modelling and trade execution
- Algorithmic tools will support higher volume flow trading on electronic platforms with minimal human inputs
- AI Cloud-based tools support enhanced client servicing and predictive analytics

- Banks' Operations infrastructure will increasingly be delivered by external 3rd parties providing discrete optimised services at lower cost
- Big tech firms will provide much of the cloud/platform infrastructure
- Utilities or mega banks that have 'become the platform' will increasingly provide standardised services across the industry in areas with no competitive advantage (e.g. market data)
- 'Smart contracts' (on DLT) will enable automatic execution and processing of trades based on pre-agreed conditions

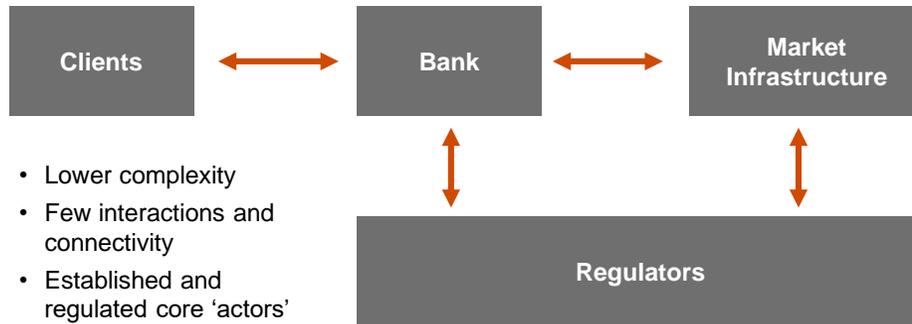
- Sophisticated tools, using AI, will support complex analysis of multiple financial and risk factors to drive optimal use of the balance sheet, regulatory capital, liquidity and funding
- Cloud-enabled 'intelligent dashboards', available digitally, will help these functions better identify risk exposures
- Legal and Compliance will leverage predictive monitoring tools, for example to generate market compliance and fraud insights from large volumes of market data
- Banks will interface with regulators via open APIs to fulfil e.g. regulatory reporting requirements via machine executable rules that are updated dynamically

- Business and IT skills will converge as roles become more technology-enabled
- IT roles may evolve towards outsourcing & vendor management functions, as the interface with third parties increase in size and significance
- AI solutions for cybersecurity will improve IT cyber-attack detection rates and support all functions to better track security risks and respond in real time

Considerations for banks and the industry ecosystem

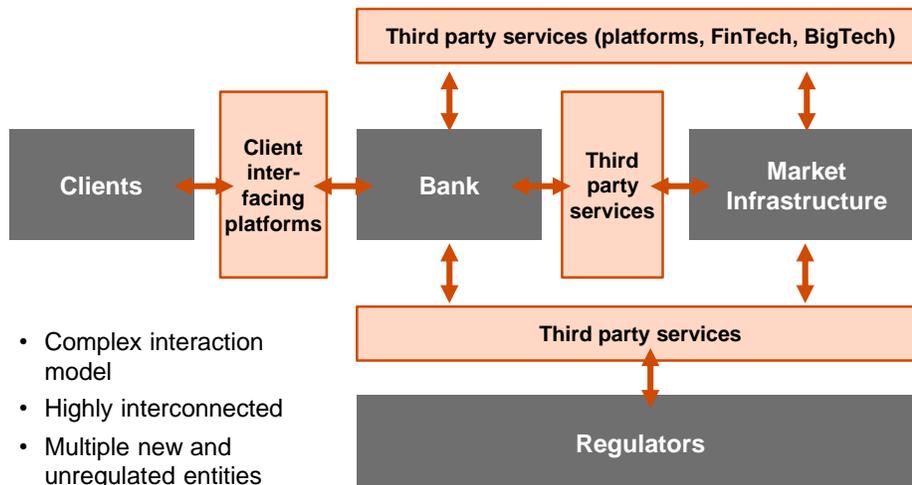
The status quo is not sustainable. Banks and market participants will need to prepare for the impacts of technology innovation.

Traditional banking ecosystem



- Lower complexity
- Few interactions and connectivity
- Established and regulated core 'actors'

Future banking ecosystem



- Complex interaction model
- Highly interconnected
- Multiple new and unregulated entities

Implications of the future ecosystem

Processes

- Banks will be leaner/ thinner as traditional core processes such as payments are fully outsourced
- Core activities such as client onboarding will be fully automated

Workforce

- Skills profiles will change as automation reduces admin roles but innovation generates new ones
- Banks will lose the 'talent war' but skills are likely to stay within the wider ecosystem

Data

- Volumes and complexity of data flows between parties will be significantly greater
- Standardisation enabled by harmonisation of data standards globally

Regional/ Global implications

- Increase in regional specialists
- New global capital markets centres
- Still remains to be seen how innovation in China will expand beyond Chinese borders

Infrastructure

- Shift to Public Cloud across all services will enable a move away from legacy infrastructure
- Concentration of services into BigTech cloud service providers will require future regulatory focus

Third parties

- Significant increase in shared services, via industry platforms and FinTech partnerships
- Regulations will extend to non-banks with requirements for kitemarked services

Regulation

- Role of regulators may change through increasingly technology focused policy and collaboration. Challenge keeping pace with regulation
- Increased requirement to oversee the broader ecosystem whilst ensuring market stability

Security and Cybersecurity

- More robust controls and safeguards will be needed to retain trust across a more interconnected industry
- Significant standardisation and automation of controls across the ecosystem

Poll question 3

Which parts of the investment bank value chain will see the greatest impact from new technologies?

1. Front Office; Sales & Trading
2. Post-trade Operations
3. Control Functions – Risk, Finance, Compliance
4. Technology & Infrastructure

Poll question 3

AFME Survey Result

Technology	Sales and Trading				Post Trade			Risk, Compliance and Finance			Information Technology
	Sales & Relationship Management	Trading	Advisory	Research	Trade Support & Processing	Product Management	Client Support & Servicing	Risk Management	Finance & Treasury	Legal & Compliance	Technology & Infrastructure
Data Management & Analytics	High	High	Med	Med	Med	Med	High	High	Med	Med	Med
Artificial Intelligence	Med	High	Low	Med	Med	Low	High	Med	Low	Med	Med
Cloud Computing	Low	Low	Low	Low	Med	Low	Low	Med	Low	Low	High
Distributed Ledger Technology	Low	Low	Low	Low	High	Low	Low	Low	Low	Low	Med

Areas where additional PwC research and interviews indicate the opportunity may be greater than shown by survey responses. For example, whilst responses on Cloud computing tended to consider the potential benefits of infrastructure solutions, the opportunities would be significantly higher for platform (PaaS) and software (SaaS) cloud services.

Principles for innovation

We have identified eight principles that banks should adopt into the future to keep pace with technology and innovation, and balance against potential new risks and cybersecurity concerns



Prioritise investment in new technology

1. Maintain a **long-term focus** for investment and innovation
2. Embed **data as an enabler** as a critical foundation for other technology capabilities
3. Embrace **open technology** such as shared banking platforms



Enable innovation culture

4. Adopt a **collaborative approach** with increased use of specialist third-parties and FinTech where needed
5. Identify **industry priorities** and support joint initiatives
6. Use **agile work practices** to keep pace with rapidly changing client needs



Develop the future workforce

7. Develop a **relationship based and technology enabled** workforce



Focus on security & resilience

8. Enable **secure and resilient operations** to balance innovation with potential new risks

Questions?

pwc.co.uk

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