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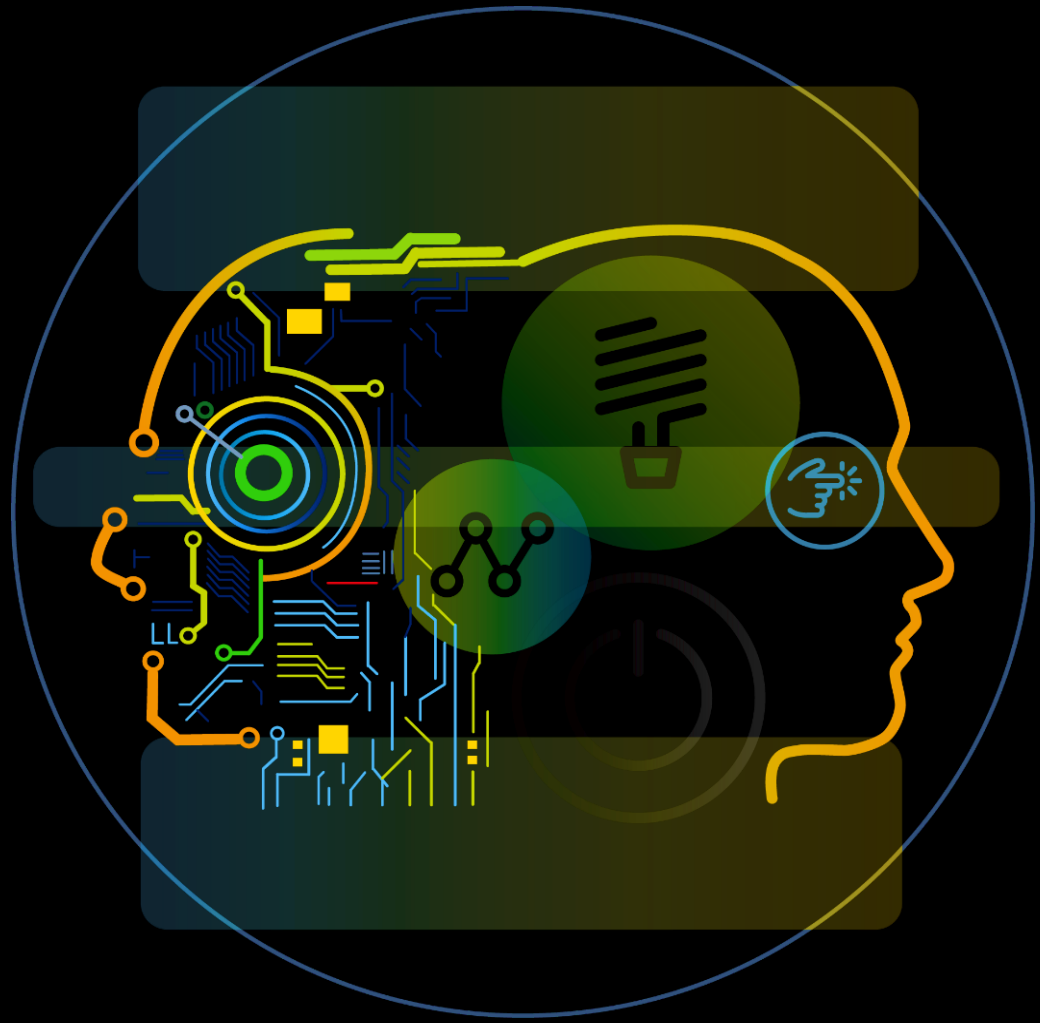


FinTech revolution meets risk management

Is the new banking business model ready to mitigate its own new risks?

Dimitrios Goranitis, Deloitte CE, October 2018

Risk Advisory

Digital Transformation

Digital Successes and Failures

Digital brings wins but also losses if not managed properly

Esma budgets EUR1.1 million for monitoring fintech and crypto-assets

05 October 2018 5 6 0

The European Securities and Markets Authority (Esma) has budgeted over EUR1 million to keep abreast of trends in financial innovation and crypto asstes over the course of the next year.

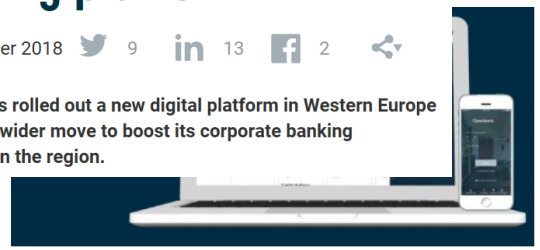
Austrian government notarizes EUR1.15bn bond auction using blockchain

08 October 2018 8 11 1

Barclays launches European digital corporate banking platform

24 September 2018 9 13 2

arclays has rolled out a new digital platform in Western Europe part of a wider move to boost its corporate banking erations in the region.



Santander dives deeper into digital with Openbank

27 September 2018 9 13 2

Danske Bank begins wearable chip trials

03 October 2018 24 22 2

Tesco Bank fined £16.4m by watchdog over cyber-attack

FCA says bank did not address warnings about 'deficiencies' until after attack started

TSB, HSBC and Barclays customers hit by IT problems

More technical failures leave what is payday for millions

Outage fever strikes UK banks

21 September 2018 0 0 0

A spate of online banking glitches has hit street banks, leadi

RBS and Barclays asked to explain 'addition to litany of IT failures'

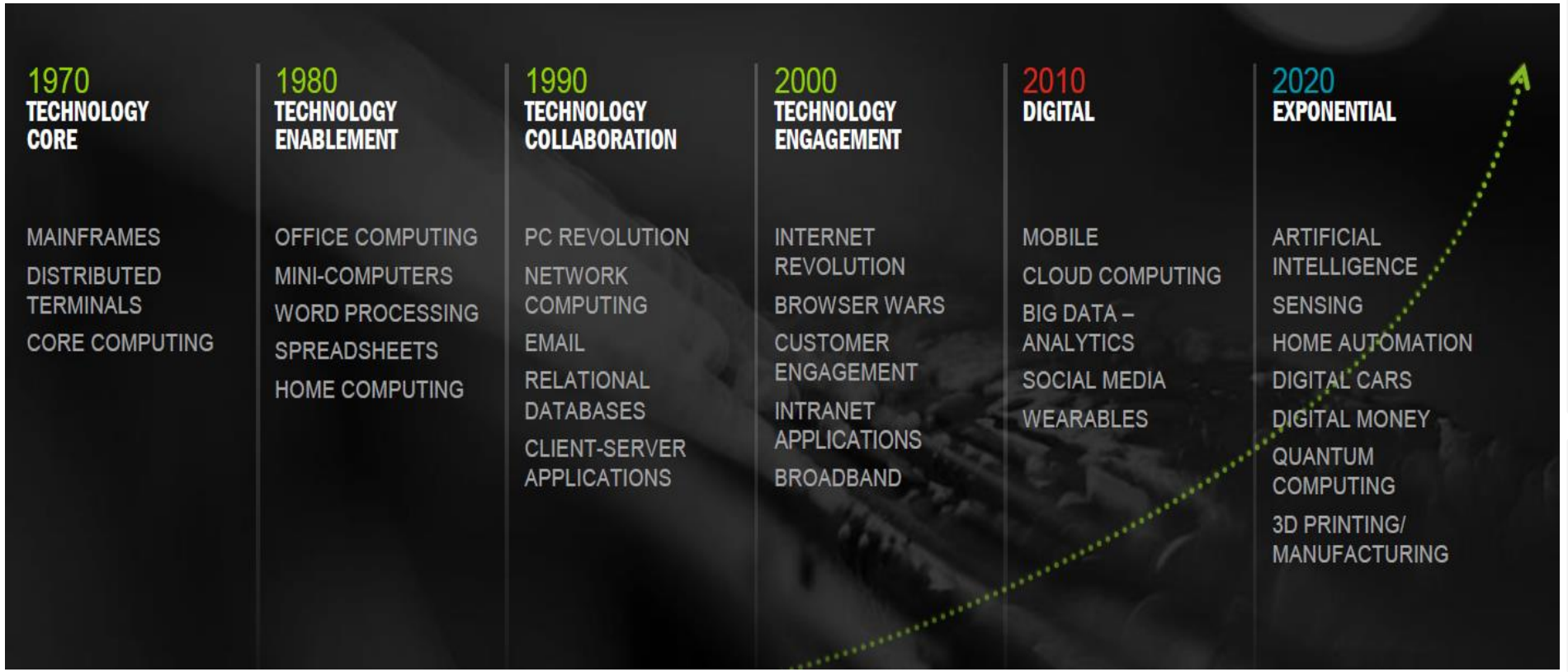
Treasury committee head calls for compensation for customers after latest glitches

Digital.

It is really happening

Digital is an Era, characterized by the creation of new business models, enabled by new technologies.

The impact of Digital on banking is imminent and has a potential exponential growth.



- Organizations can no longer evade the truth that **Digital has become the need of the hour** and the most effective enabler for creating a competitive advantage.
- The Digital Transformation brings forth unmatched **opportunities and capabilities** for growth and value creation for businesses, consumers, and investors.

Retail banking could be mostly automated by 2020

Catalysts for change

Factors that played a crucial role in the digital transformation of financial institutions

EMERGING TECHNOLOGIES

- **Technology innovation** is changing the way clients interact with the Bank;
- Exponentially increasing penetration of **smart devices;**
- Increase in **internet** speed and penetration.

Instant Lending
New Payments
Blockchain
AI/ Cognitive
RPA
Internet of Things

NEW PLAYERS

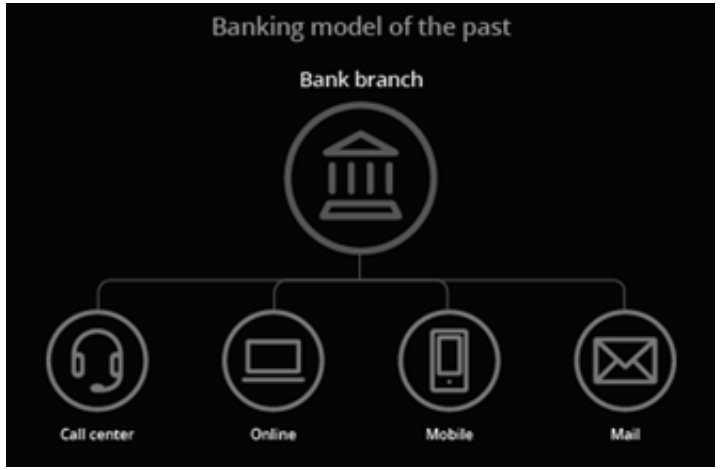
- Technology innovation is reducing the entry barriers, by enabling **new competitors** to emerge in the Banking Sector and forcing Banks to rethink themselves.

A NEW GENERATION OF CUSTOMERS

- Customers are becoming more **powerful**: they have more data, more choices, more influence;
- Evolving **customer expectations** and **changing demographics** force companies to shape their business around **customer journeys.**

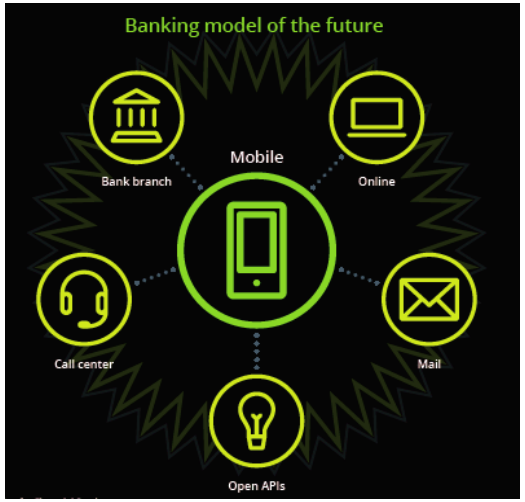
Pressure on the Business Model

What kind of bank will have the most sustainable and profitable model by 2020?

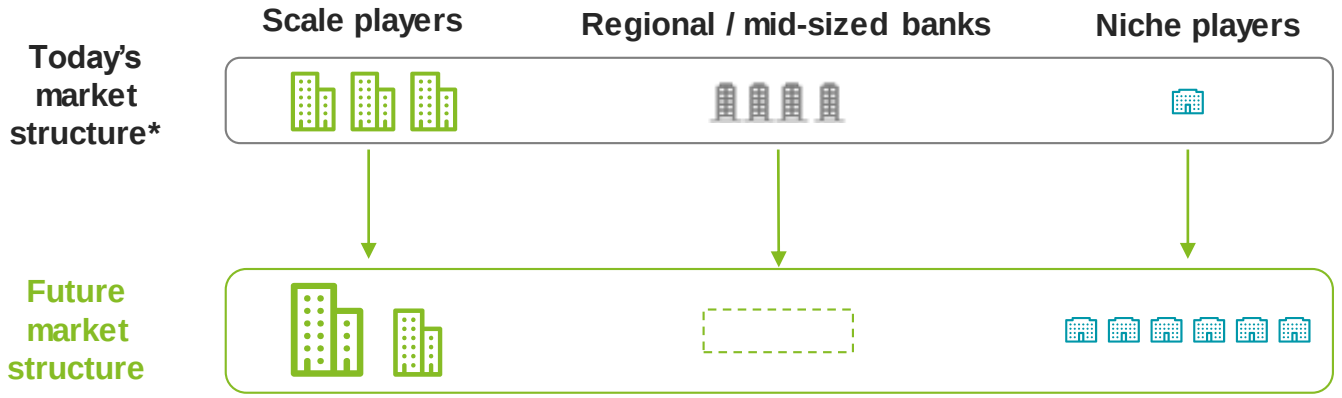


The current core business model in banking is in decline, as branches are being used less intensively.

New technology changed the foundations upon which the banking industry is built. Banks can offer their services without geographical and physical limits, making branches redundant.



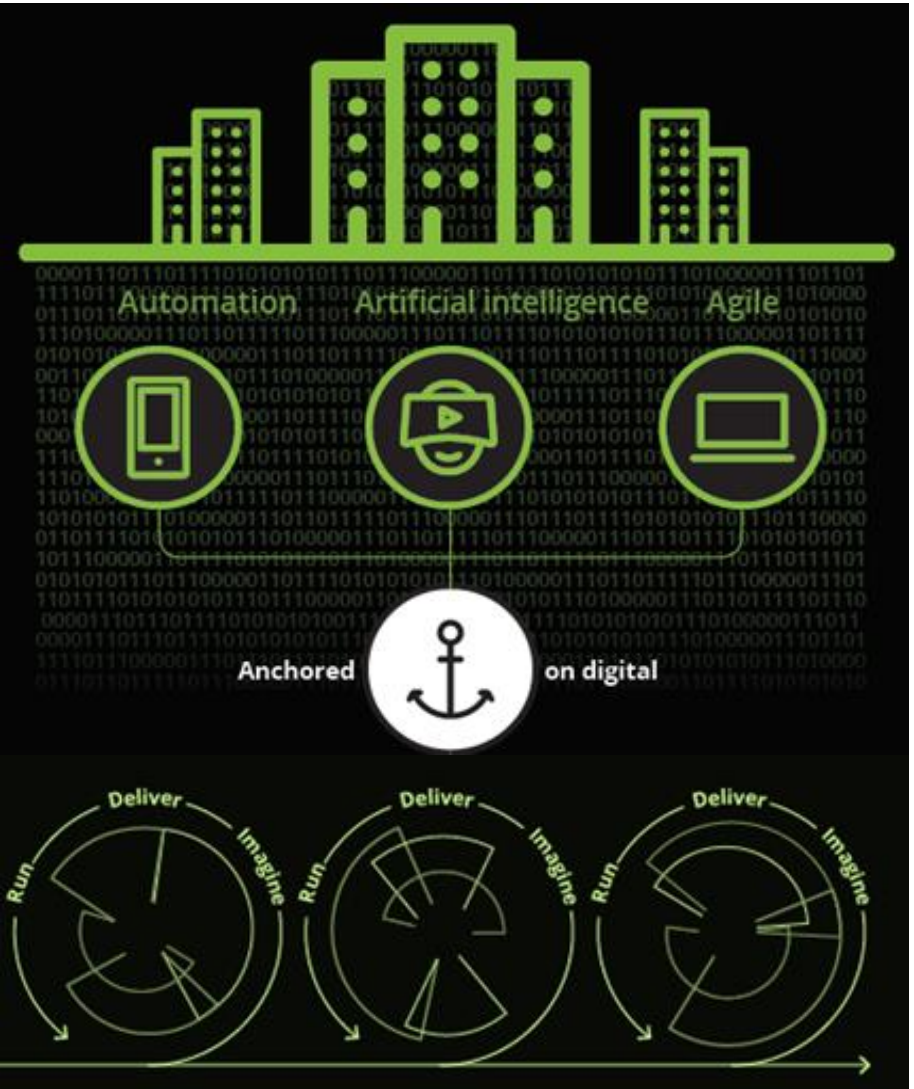
The economics of AI will push market structures to extremes, favouring scale players and agile innovators at the expense of mid-sized firms



*World Economic Forum & Deloitte - The New Physics of Financial Services

Pressure on the Operating Model | Becoming ‘Agile’

Is the Bank organised in a manner that allows a quick reaction to market and industry developments?



- The pace of technology is forcing banks to **restructure how their business units operate**. They no longer have the luxury of time, or the comfort of rigid business unit silos.
- **Product and service agility** has become a strategic priority for banks.
- ‘Agile’ is key to responding to the **increased speed** of business change, social shifts and technology advances.
- ‘Agile’ empowers teams to **self-organize and collaborate** to continuously improve and make fast and transparent decisions
- Banks that are too slow or ineffective in their adoption of technology will be **left behind**. Firms that quickly and safely harness technology in a value adding way will survive and thrive going forwards.

FinTechs lead innovation in the banking industry...

... but failed to disrupt the competitive landscape

FinTechs have undeniably made their mark on the banking industry, as they:

- shaped and paced **innovation** across financial services;
- set higher standards for **customer expectations** and user experience.

FinTechs will likely be more successful servicing and partnering with banks, especially in the area of data sourcing, data analytics, and cognitive technologies.

Banks will likely maintain market leadership due to certain factors that work in their favour:

- **regulatory barriers to entry -** Banks are essential intermediaries between risk and their stakeholders and FinTechs are not taking over this essential role in the economy.
- **convincing customers to switch -** FinTechs have underestimated customer willingness to switch from incumbents.
- **the capital to absorb, partner with, or replicate FinTechs -** FinTechs have struggled to create new infrastructures.

Banks will likely remain dominant, but teaming with the extended ecosystem will become a key source of competitive advantage.

Digital Benefits & Risks

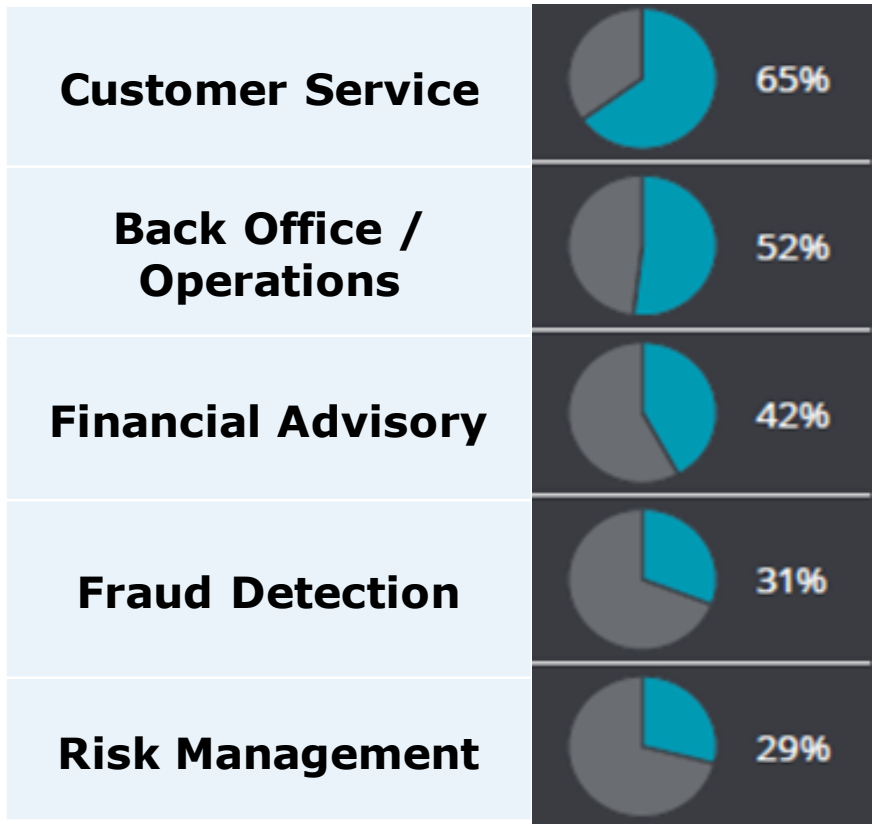
Potential benefits of digitalization

What areas of the bank will be mostly impacted?

Innovation drives efficiency and cost cutting

- In the branch and back office, new technology is **stripping costs, increasing productivity, reducing risk** (by enhancing risk and compliance capabilities)
- Automated systems can help banks **reduce costs by 30-40%** in targeted areas, including middle and back-office operations and shared services.
- Automation is more than a cost saving exercise. It increases productivity by **streamlining end to end processes.**

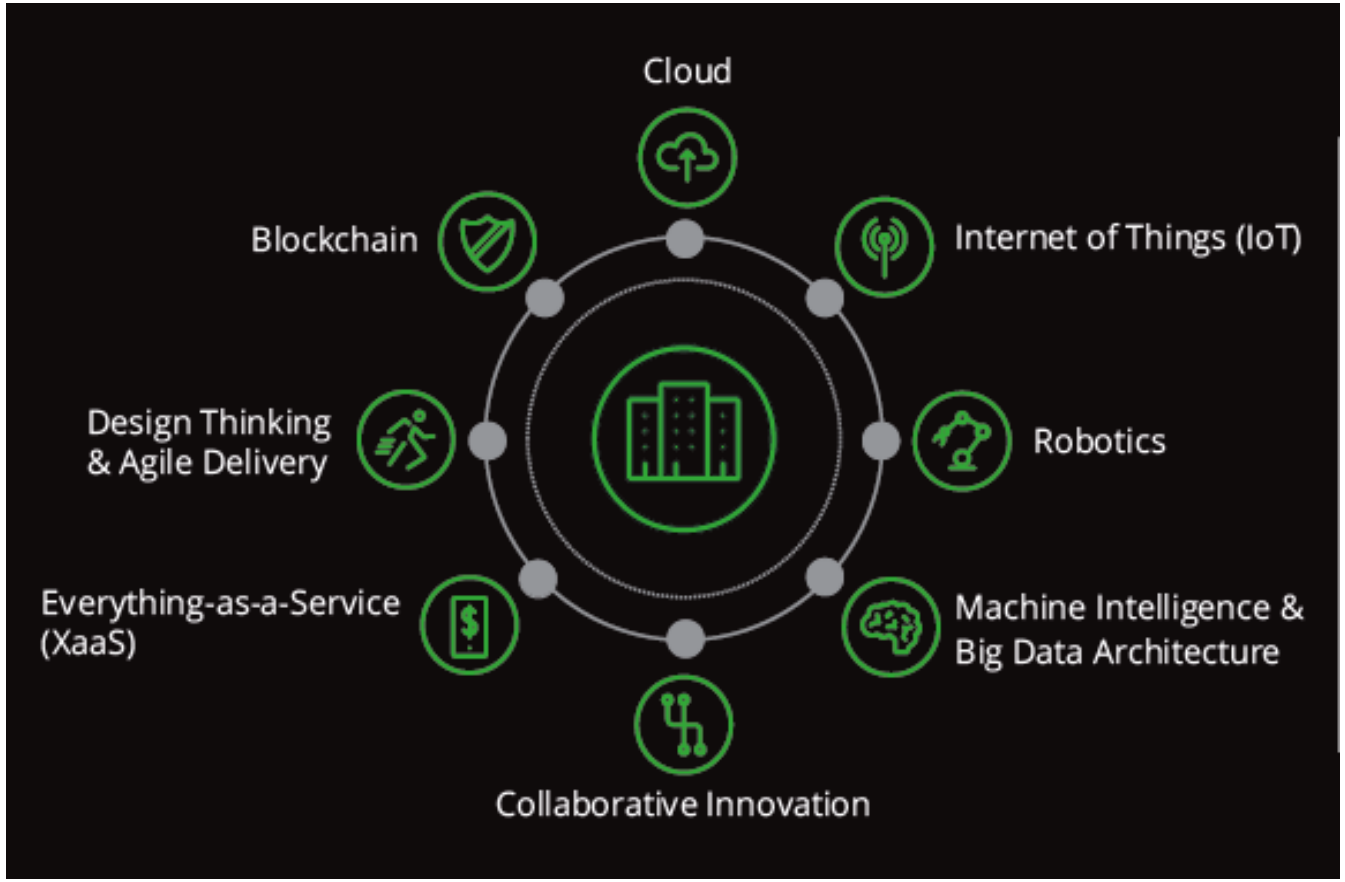
On which part of the bank do you see AI having the greatest impact?*



* The data is taken from a survey performed by Deloitte in 2017 of more than 3000 C-suite executives with the European Financial Management Association (EFMA).

Technologies that are driving the transformation

Disruptive technologies are reshaping the way banks create value



Distribution

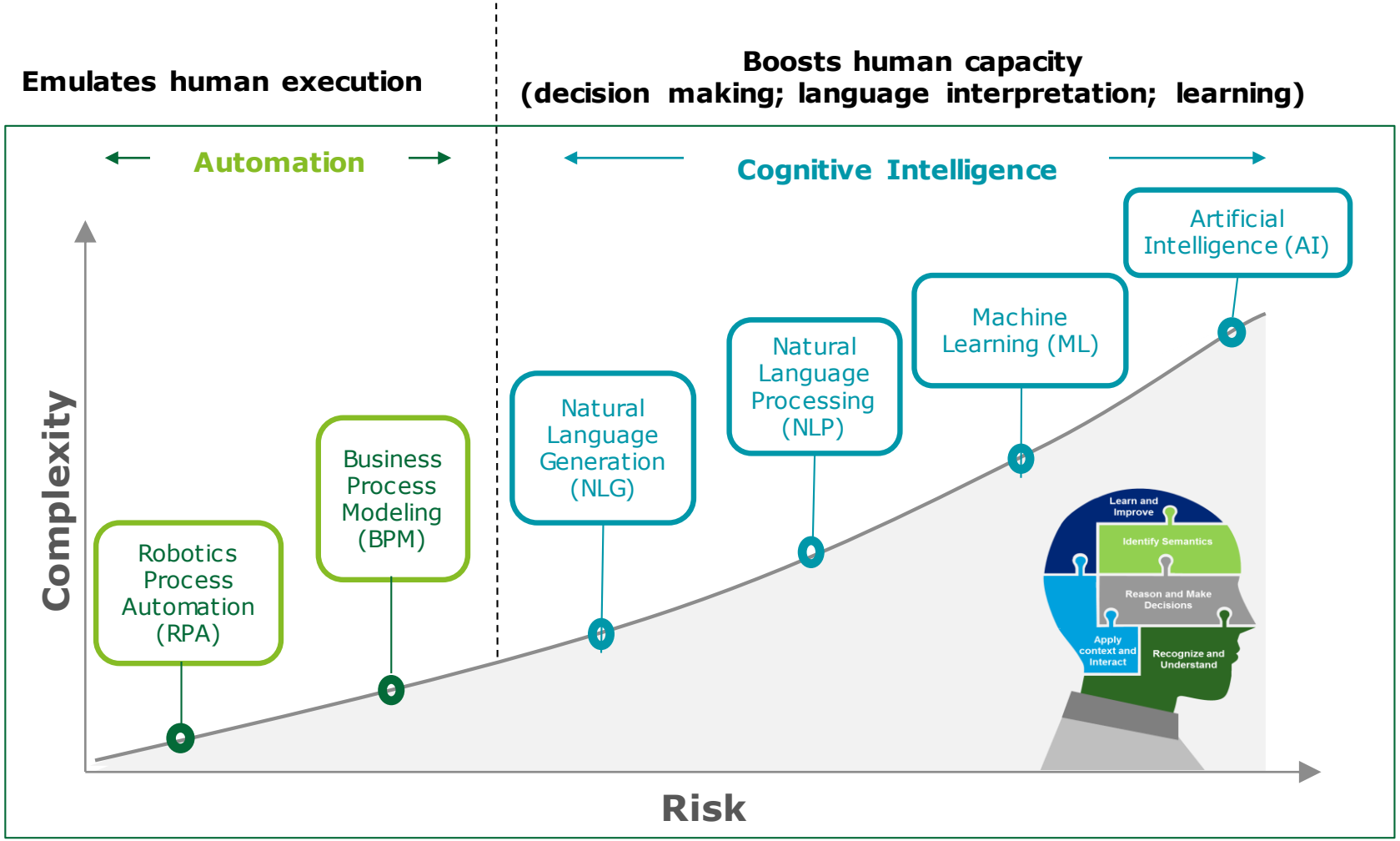
- Distribution of traditional bank offerings are significantly transformed as **mobile banking** continues to become the dominant mode of interaction with consumers.
- Integration with **wearable devices** will likely become a key differentiator in distribution.

Services

- New **payment mechanisms** are changing customer behavior.
- **Robo-advisers** are forcing investment managers to evolve.
- New **lending platforms** are transforming credit decisions and loan origination.

Disruptive technologies | Disruptive risks

Automation and Cognitive solutions introduce new, complex risks



- Are the emerging technologies designed to meet **regulatory requirements**?
- How to ensure smart technology **adheres to policies**?
- What **oversight/ assurance** is needed across the 3 Lines of Defense?
- Are **appropriate mechanisms** included to detect, respond, and recover from risks facing these new technologies?

Managing risks in the digital era is critical to an organization's sustainability

The biggest challenge for firms is less about dealing with completely new types of risk and more about existing risks being harder to identify or manifesting in unfamiliar ways

Strategic Risk

- The rapid growth of FinTechs increases the **risks to profitability** in traditional banks.
- Existing financial institutions could lose a substantial part of their **market share** or **profit margin** to new entrants.

Data Risk

- The digital era leads to more IT **interdependencies** and **interconnectivity** between infrastructures, so data errors can spread wider and faster

Conduct Risk

- **Sales** will be performed through **self-driving agents** as opposed to staff, opening up a new type of conduct risk. It will be difficult to **justify** to regulators how **decisions** are made in complex AI applications.

Operational Risk

- A proliferation of innovative products and services may increase the **complexity of financial services delivery**.

Cyber Risk & Security

- Organizations have to take robust measures around cybersecurity by performing **information and cybersecurity assessments** of systems.

Regulatory & Compliance Risk

- Banks will need appropriate **AML/CFT monitoring** processes for newly implemented technologies.
- Banks will need transparency on how they process, store and use **data** through AI.

Organisational Risk

- **Cultural challenges** and **decreased morale of employees** due to large scale AI adoption.

Technology Risk

- The "black box" of AI and automation algorithms **limits transparency** into the workings of the technology.

Liquidity Risk

- Increased **volatility of deposits** facilitated by mobile technology, leading to higher liquidity risk for banks.

How confident are you about managing these risks well NOW? How confident are you about managing them in the FUTURE?

Organisational | Operational Risks

It is critical to understand and manage all risks that an organization may be exposed to in a digital environment

Operational risk	Organisational risk
• **Legacy bank IT** systems may not be sufficiently adaptable; • **Change management** may be inadequate; • **Outsourcing** or other partnerships increase complexity and **reduce the transparency** of end-to-end operations; • Ineffective AI oversight procedures can lead to **high-impact operational errors** due to the "unknown" factor.	• The replacement or repurposing of staff, negatively impacts **employee morale**. In the next few years, machines are likely to do **10-25% of the work** across bank functions, increasing **lay-offs**; • Banks are becoming increasingly **reliant on heavily skilled technologists**; • The new technologies may introduce **training challenges;** • **Culture:** Negative impact of **fear of change** concerns about the changing profile of jobs within the bank.

Technology | Security | Cyber Risks

Cyber risk should be a core decision-making factor in everything banks do to transform

Cyber risk

- Cyber risk will have to become a **dominant component in strategy and business decisions**, ensuring that cyber security is a key consideration in the design of business processes and innovation.
- Cyber risk should be embedded into the bank's **operations ex-ante**, as opposed to ex-post.
- Increased **interconnectivity** between market players can amplifying security risks.

Security Risk

- The increasing volume of online and mobile transactions means that banks need to continually increase investment into newer technologies to **make these channels safer** as well as seamless by using: Biometrics, secure video links, and distributed ledger technology (DLT).
- The need to combine convenience with rigor in **customer verification procedures** is crucial in light of banks' "Know Your Customer" (**KYC**) obligations, and the related responsibility to protect the system against **AML** risks.

Technology risk

- **Business continuity, disaster recovery** and also **digital resiliency programs** must be taken into account when implementing advanced analytics and AI technologies.
- AI working faster than agreed-upon SLAs may **overwhelm existing IT systems**, especially when the banks continue to rely on legacy infrastructure designed tens of years ago.
- FinTech can present **information security and access control challenges**. Also, AI may be used inappropriately to perform tasks or scrape data from the applications.

Conduct | Regulatory & Compliance Risks

Banks continue to pay out billions in recompense for AML issues and miss-sold products. Nobody wants more multimillion-dollar fines if AI proves defective too.

Compliance Risk

Banks are the most likely to fear fines for getting it wrong, with using AI

- **AML/CFT :** Banks will need appropriate AML/CFT monitoring processes if **they use FinTech in the identification and prevention** of these risks. Also, the higher level of automation and distribution of the products or services can result in **less transparency** on how transactions are executed.
- **Data privacy and protection:** The risk of not complying with customer data privacy rules (e.g. GDPR) and how these data are used, may increase with the development of big data and outsourcing.
- Incorrect and/or incomplete **regulatory reports** generated through RPA may result in regulatory issues and expensive fines.

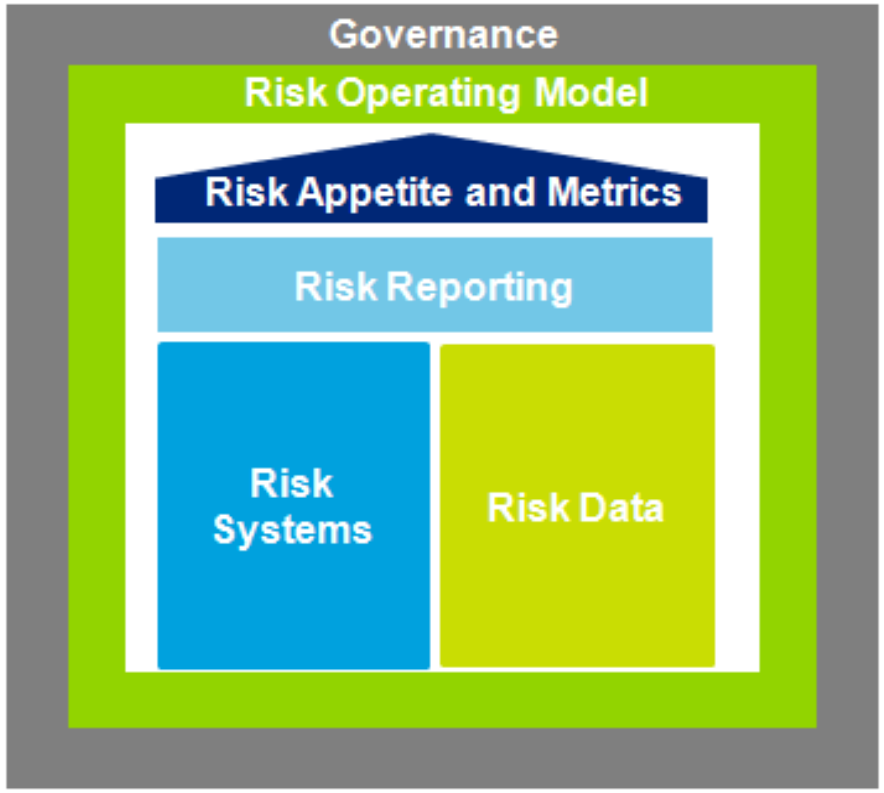
Conduct Risk

How to ensure that algorithm-driven decision-making can be trusted and held accountable?

- Banks are particularly keen on developing AI-based **robo-advice** capabilities, as relationship managers comprise a significant portion of their cost base. If misconduct does occur, it will be on a much larger scale due to the **connectivity of AI.**
- Banks will have to **justify how AI** and automated systems **make a decision**, whether used for verification and fraud detection, transactions or product sales.
- **Product development:** Risk of products being developed which do not meet customer needs and related risk of widespread misselling.

Data Risk

Data plays a key role in the organisation



- The digital era leads to more IT **interdependencies and interconnectivity** between infrastructures, therefore **data errors** can spread wider and faster;
- The increasing volume of online and mobile transactions and new account sign-ups means that banks need to continually increase **investment into newer technologies;**
- **Management information** and **risk reporting** are one of the clearest areas in which rapid advances in data analytics could be deployed to enhance:
    - **Data quality**
    - **Data availability**
- Input data provided by developers to train the algorithms used for new technologies may be incomplete, outdated, or biased. Also, flawed assumptions, **inappropriate modeling techniques and coding errors**, can present more data risk.

Projects like AnaCredit and BCBS 239 will define the relationship of the bank with the supervisors. Lack of reliance on risk data reporting could mean extensive on-site inspections.

Supervisory Implications

A supportive regulatory environment for FinTechs

Fintech Regulatory Sandboxes

Current bank regulatory, supervisory and licensing frameworks generally predate the emergence of technology-enabled innovation. In most jurisdictions, prudential authorities do not have a remit for firms that are not banks.
The establishment of regulatory sandboxes is a growing initiative around the globe, as regulators realise that Fintech innovation is an important part of the global financial system.

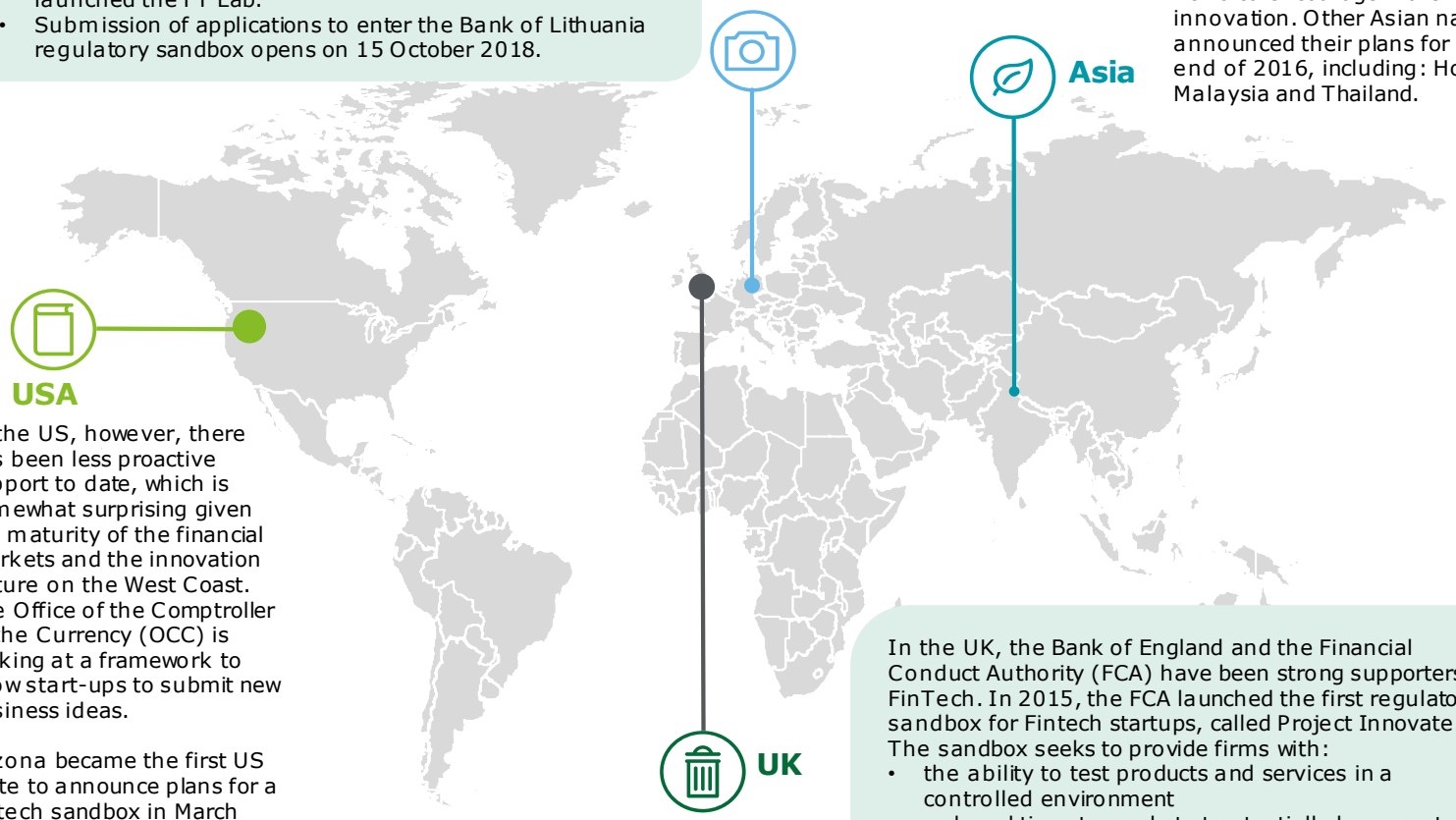
What is a regulatory sandbox?	Why do we need regulatory sandboxes?	How it works?
• A sandbox is a framework set up by a financial sector regulator to allow **live testing** of financial innovations, new products or services in a **controlled environment**. • Sandboxes may be considered to be more than just a dialogue or an informal exchange as they happen under the **regulator's supervision**.	• The purpose of sandbox environments is to facilitate innovation while limiting impact on customers and the banking system. • Sandboxes aim at encouraging FinTech experimentation, without compromising on customer security. • The sandbox can be made available to regulated as well as unregulated firms. • Sandboxes also attract the attention of different investors like banks, private equity and venture capital funds as regulatory uncertainty discourages investment.	• The sandbox approach entails a prior application process and selection by the supervisor. Several criteria may have to be met by a firm when applying for a sandbox (e.g. being a genuine innovation with a consumer benefit and being ready for market; having a proper exit strategy) • In addition, the testing environment often involves operating restrictions for the firms conducting the test (e.g. a maximum number of clients or maximum transaction level). • Sandbox testing typically runs for a predefined period of time.

Most of the Fintech regulatory sandboxes are in Europe and Asia

The EU to publish guidelines for a cross-border regulatory sandbox in December

- In the Netherlands, the Authority for the Financial Market (AFM) and De Nederlandsche Bank (DNB), combined forces for a regulatory sandbox;
- Denmark's Financial Supervisory Authority (Finanstilsynet) launched the FT Lab.
- Submission of applications to enter the Bank of Lithuania regulatory sandbox opens on 15 October 2018.

- **Netherlands**
- **Denmark**
- **Lithuania**



In Asia, regulators are expressing enthusiasm for RegTech solutions. The Monetary Authority of Singapore (MAS) launched their Fintech sandbox in 2016 to encourage more Fintech experimentation and innovation. Other Asian nations and agencies announced their plans for Fintech sandboxes at the end of 2016, including: Hong Kong, Indonesia, Malaysia and Thailand.

With Britain's decision to leave the EU, the European Union's banking supervisors indicated that there is an urgent need for a cross-border sandbox and innovation hub that will nurture the continued growth of Fintech startups in the EU.

As such, the European Banking Authority (EBA) has said that the watchdog will publish guidelines in December 2018 that will include recommendations for the core design of a cross-border regulatory sandbox.

USA

In the US, however, there has been less proactive support to date, which is somewhat surprising given the maturity of the financial markets and the innovation culture on the West Coast. The Office of the Comptroller of the Currency (OCC) is looking at a framework to allow start-ups to submit new business ideas.

Arizona became the first US state to announce plans for a Fintech sandbox in March 2018.

In the UK, the Bank of England and the Financial Conduct Authority (FCA) have been strong supporters of FinTech. In 2015, the FCA launched the first regulatory sandbox for Fintech startups, called Project Innovate. The sandbox seeks to provide firms with:

- the ability to test products and services in a controlled environment
- reduced time-to-market at potentially lower cost
- support in identifying appropriate consumer protection safeguards to build into new products and services
- better access to finance.

Supervisors should avoid becoming complacent about progress to date

Addressing prior problems successfully does not guarantee banks being able to respond to future risks

Shifts in the macroeconomic environment and technological change create new risks to financial stability that require bank supervisors to reassess their supervisory models and resources, in order to ensure continued effective oversight of the banking system.

Financial stability

Financial stability can be enhanced by implementation of supervisory programmes to ensure that banks have **effective governance structures and risk management processes** for the use of FinTech. These structures and processes include:

- Robust **strategic and business planning** processes that take into account the impact of new technologies and market entrants;
- **Risk management** processes that are relevant to FinTech developments;
- **Staff development** processes to ensure personnel has the appropriate awareness and capability to manage FinTech risks;
- Sound **new product approval** and **change management** processes;
- Processes for monitoring and reviewing delivery channels including those related to **consumer protection, data protection and AML/CFT**;
- controls over **outsourced** services are maintained to the same standard as those applied to the bank itself.

Systemic risk

Structural changes in the financial system require continuous surveillance of systemic risk. Systemic risk assessment entails monitoring of different areas:

- tracking **interconnectedness** within the system; While recent observations suggest a reduction in the interconnections between banks, this remains a key channel of contagion.

- The **shifting of risk out of the banking sector;** After the crisis, the need for continuous central bank investment in systemic risk analysis of the non-bank financial sector has been highlighted. For example, **liquidity risks** associated with the growing size of portfolios of asset managers, and the activities of shadow banks in providing intermediation services.

Supervisors themselves need to become adopters of new technology

The rise of SupTech

Supervisors must take advantage of the digital era to free up their staff, by automising routine tasks, to be able to focus more on the sophisticated and strategic tasks required to scrutinise bank risk-taking.

SupTech differs from RegTech, as SupTech is not focused on assisting with laws and regulations compliance, but on supporting supervisory agencies in their assessment of that compliance.

- Technology can help supervisors become more efficient in the way the data is shared between them and banks. The bespoke data requests made to banks can generate a substantial burden. With collaboration between the industry and supervisors, it could be possible to improve the data sharing systems via automation.

- Supervisors need to embed themselves within the "big data" that the industry is now creating by building systems that allow their analysis to be updated in real time as the market is moving. This is particularly important given that digitalisation vastly expanded the amount of data that the banking sector is generating and has also increased the speed with which transactions are processed.

- Supervisors should use AI and machine learning to improve the way they analyse the credit risks being taken by the banks. They can use AI to help spot excessive bank risk-taking early on in its gestation and support them intervene early, before potential problems become reality.

Data driven supervision

Digitalisation of remote supervision

Remote supervision data driven tools

ECB's Statistical Data Warehouse will enable cross-country and cross-market analysis

- The European Systemic Risk Board (ESRB) requires a wide range of frequent, timely and **detailed macroprudential statistics** on both a consolidated and residency basis.
- Employing network **contagion models in stress tests** requires granular data on both the credit exposures and funding structures of financial institutions
- The indicators are increasingly, covering more than banking sector, with a strong focus on **shadow banking** and also on commercial and residential real estate markets.

Examples of digital tools used in risk management:

- **artificial/cognitive intelligence** in stress tests;
- **automatically aggregating data** to assess capital and liquidity for use in internal models and in reports to regulators, and in monitoring employee behavior;
- **Robotics process optimization (RPA)** for control checks and regulatory reporting;
- **Natural language processing (NLP) for** anti-money laundering, know your customer risk summary memos, and model validation reports.
- **AI algorithms** for granting loans that analyze not only the borrowers' credit data but also their Facebook and Twitter posts.

"With a fast growing financial technology industry, the way banks conduct business is changing significantly.

Technological trends such as **big data, blockchain, cloud services, open banking and machine learning** are not only automating some processes, like banking services, trading and underwriting, but they might also change the underlying methodologies, especially for risk underwriting.

On the other hand, with **generational shifts** and rapid adoption of new technologies by consumers, financial technology is shaping the pallet of financial products and services banks offer to their customers and also changing the way their clients are approached. To compete with **non-bank competitors**, banks need to get closer to their customers by creating a completely virtual experience, potentially modifying the role of primary account providers. Improving technology could be a tail-wind to the banks' non-interest income potential for increasing revenues and with it profitability."

Speech by Adam Farkas, Executive Director of the EBA; Speech at the Deutsche Bundesbank Conference - *Bank business models - Structural changes and their systemic implications*
Frankfurt, 20 February 2018

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Dimitrios has joined Deloitte CE in January 2017, in FSI Risk and Regulatory practice. Prior to Deloitte CE, Dimitrios was leading the FSI Risk Advisory practice in Deloitte Malta. Dimitrios has had extensive experience with national and supranational regulators including US Federal Bank, ECB, SSM, ESM, ESMA, EBRD and regulators in UK, Belgium, Greece, Cyprus, Ireland, Portugal, Malta, Bulgaria, Slovenia, Romania, UAE, Kazakhstan etc Dimitrios has supported a number of clients during the credit crisis and has worked extensively with regulators and lenders on asset quality reviews and stress testing, credit risk transformation programs, supervisory frameworks and recovery/resolution frameworks

Relevant experience :

- Supervisory process evaluation and supervisory tools for Central Banks (Malta, Slovenia, Albania, Macedonia);
- IFRS9 and Basel III implementation for multiple tier 1 banks in Romania, Moldova, Malta etc;
- SREP Transformation project for Meditarennean Bank plc (AnaCap) in Malta-Belgium-UK;
- Bank Crisis Simulation War Game: Central Bank of Malta – Engagement partner responsible for the first war game in Malta scoping in the Central Bank, Malta Financial Services Authority, National Resolution Authority and the Ministry for Finance;
- Recovery Plan for multiple systemic lenders and LSIs
- Pillar II AQR, Stress Test , Recovery and Resolution n PMO and Quality Assurance support to Bulgaria National Bank – Engagement partner. Full scope PMO and QA of the country wide project in relation to 22 licensed banks in the country;
- Pillar II AQR, Stress Test, Recovery and Resolution PMO and QA support to MFSA - Full scope PMO and QA support to MFSA/ECB in relation to 2014 AQR of three systemic banks in Malta;
- Pillar II AQR and stress test of five tier 1 banks in Greece - Full scope Asset Quality Review of five tier one banks in Greece on behalf of Blackrock Advisory and European Central Bank. The review extended to their international holdings in six countries in Eastern Europe, Switzerland, UK, and Turkey;
- Pillar II AQR and stress test of two tier 1 banks in Cyprus
- Financial due diligence, Valuation and recovery/recapitalization by European Stability Mechanism of a systemic lender in Greece;
- Resolution of two tier 2 lenders in Greece

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