FUTURE OF BANKING

CAPITAL MARKETS

Race is on as tech shakes up capital markets

The next decade or so could herald more changes in the capital markets than in the past 40 years and only the most innovative players will survive

Ian Fraser

The main players in global capital markets – investment banks, asset managers and stock exchanges – collectively generate some $500 billion in revenues each year. But according to William Wright, founder of think tank New Financial, this is far from sufficient to ensure their survival.

The industry is in the middle of a "perfect storm", he says, in which revenues and margins are being driven down by tighter regulation, the rise of technology, changed social expectations and latterly also by Brexit.

Some incumbent financial institutions, ill-prepared for the technological changes that are revolutionising their industry, are still deploying customer-unfriendly business models, processes and intermediated value chains that haven't much changed for decades.

This is creating an opportunity for far-sighted insurgents, which are not burdened with legacy systems or tied to obsolete practices, to embrace new technologies and ways of working to disrupt the established players out of existence.

Though margins in asset management have held up at around 40 per cent in the 11 years since the financial crisis of 2008, Christian Edelmann, co-head of Europe, Middle East and Africa financial services at Oliver Wyman, warns they are at risk of plummeting.

"We see a scenario in which asset management will be transformed through the rise of an Amazon-style marketplace distribution model, in which price will be evermore important," he says. "In this scenario, we believe 50 per cent of traditional asset management fees could be at risk."

Mr Wright adds that other storm clouds looming for asset managers include regulators "now looking at the industry from consumer and competition perspectives, rather than from a purely financial stability or a conduct perspective". He also believes job numbers will come down as artificial intelligence and technology replace human investors and traders, and not just at one or two quant-based hedge funds.

> **Our clients in investment banking understand that, in the future, their industry will be a technology game with a banking licence attached**

Investment banking is facing similar pressures. European banks, unlike their Wall Street rivals, have seen profitability decimated since the 2008 crash, with some firms opting to withdraw from investment banking altogether.

Mr Edelmann says: "Our clients in investment banking understand that, in the future, their industry will be a technology game with a banking licence attached."

Better capitalised and more profitable Wall Street investment banks are better placed to make the transition to modular platforms than more troubled European players and are likely to be the long-term survivors.

According to Mr Wright, any player that lacks £200 million or so to invest in super-efficient new trading systems or super-efficient back-office processes is going to struggle or fail in the new environment. Others expect the investment banking business will fragment along the more specialised lines, as existed before Margaret Thatcher's government liberalised financial markets with the so-called Big Bang in October 1986.

It may have been founded in 1850, but SIX, the Swiss stock exchange, is ahead of the game when embracing new technologies is concerned. The Zurich-based bourse's head of securities and exchanges Thomas Zeeb has confirmed it will launch the SIX Digital Exchange. SDX promises to be a groundbreaking digital asset exchange, powered by blockchain, a distributed ledger technology which records data across a network of computers rather than on a centralised server. It will start trading digital tokens in a pilot phase from next month.

Mr Zeeb says tokenisation will enable smaller companies that would normally be unable to launch initial public offerings (IPOs) and participate in equity markets or to issue bonds to do so, and that it will also broaden the pool of capital. "The cost of doing IPOs and issuing bonds will come down dramatically, opening up funding options for smaller firms and for project financing," he says. "There will also be new asset classes; you can tokenise property and fine art."

The London Stock Exchange (LSE) is also gearing up for the use of blockchain technology in the trading of financial instruments. In April it hosted the first issue of equities using blockchain-based tokens, when round £3 million-worth of shares in the fintech firm 20|30 were floated in tokenised form. The LSE has also invested in the London-based fintech startup Nivaura, which has issued the world's first automated crypto-denominated bond.

Even though consolidation of ownership among European stock exchanges can be expected to continue, Mr Zeeb doubts whether there will ever be fewer than one exchange per country. "We're seeing nationalism growing rather than decreasing in Europe," he notes.

Mr Wright says European policymakers are going to have to do more to broaden and deepen the continent's capital markets. European corporates currently obtain 75 per cent of their funding from banks and just 25 per cent from the bond markets, the exact inverse of what happens in the more developed US capital market.

"The clear view is that you need to reduce dependency on banks and that, by going more towards a capital markets structure, you will create more attractive and diversified opportunities for investors," he says, adding that Brexit is going to "break the European capital market in two" undermining such plans.

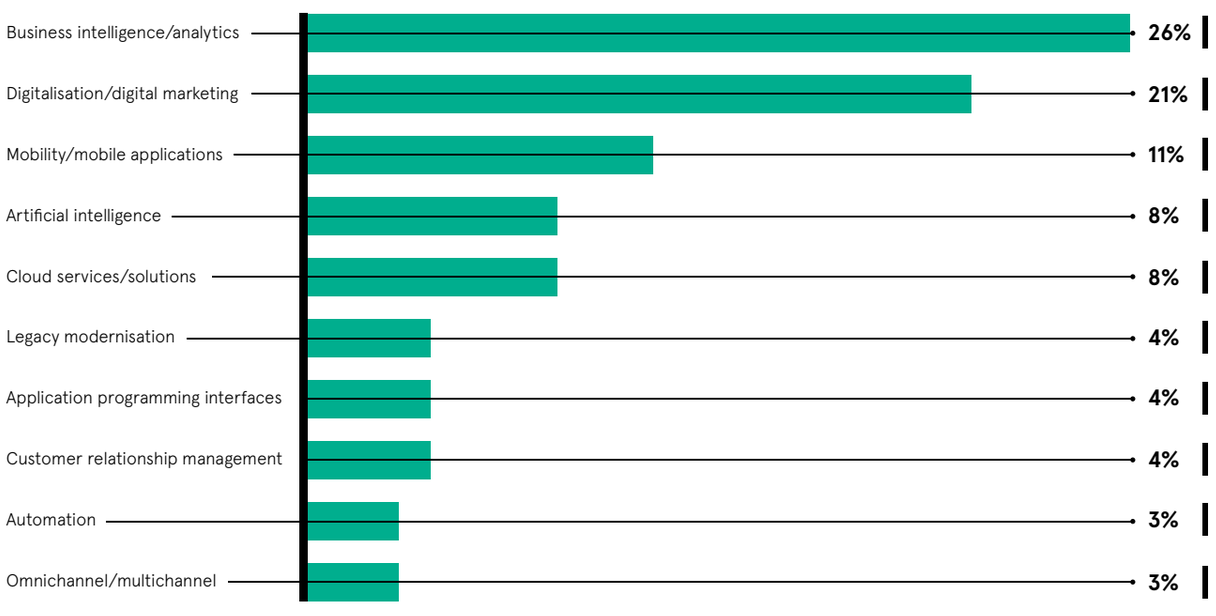
Mr Wright singles out a surprising disconnect between the outlook for capital markets activity, which he says is generally very rosy as "the number of companies seeking to raise capital, the amount of sales and trading activity, the number of people becoming wealthier and putting money into savings and investments" is going up. For industry players, especially in investment banking, "profitability is being driven down, causing the hollowing out of what has traditionally been a highly profitable endeavour", he says.

"I'm bullish on the outlook for activity, but bearish at the industry level. Within this, not everybody is going to suffer to the same extent. A small number of large firms are likely to become even bigger and more profitable. And a large number of smaller, less profitable firms today will either disappear or find themselves merging with other firms in a desperate attempt to make the economics stack up," says Mr Wright.

SIX's Mr Zeeb predicts an even bigger revolution for the capital markets industry: "Over the next 15 years, I am convinced we're going to see more changes in how capital markets function than we've seen in the last 40 years," he concludes.

IT PRIORITIES IN BANKING AND INVESTMENT SERVICES

Priority ranking of IT areas by chief information officers in the industry



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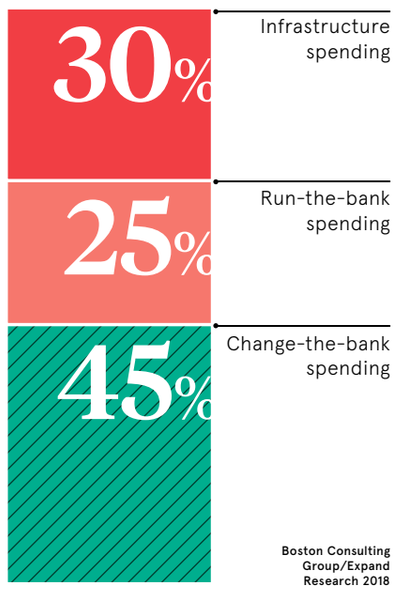
TECHNOLOGY BUDGETS AT INVESTMENT BANKS

More than half of IT budgets are directed at non-innovation spending



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Cloud: the heart of the digital banking revolution

Cloud adoption will help position financial institutions for success in a rapidly changing, customer-focused landscape, according to leading global technology and management consultancy **Capco**

The financial services industry is navigating an unprecedented set of challenges: a sea-change in consumer expectations, an extended period of regulatory upheaval, onerous new capital and liquidity requirements, and - crucially - the rise of challenger banks and other new disruptive market entrants.

Already underpinning familiar offerings such as Netflix and Amazon, cloud technology has the potential to transform some of these challenges into opportunities for the industry, promising greater agility and innovation to enable financial institutions to remain competitive.

"Cloud providers have evolved considerably in recent years," says Derek Lum, UK head of cloud advisory at Capco. "Their proposition meets the very specific requirements of financial institutions, prioritising security and regulatory compliance. In turn, those institutions increasingly view the cloud as an enabler of change, offering scalability, innovation and greater ease of operations."

Cloud technology offers institutions the power to gather, store, analyse and leverage data from millions of customers more effectively and cheaply than traditional in-house or on-premise systems.

60%

of financial services firms expect multi-cloud to be the architecture of their IT environments in the next two years

47%

say that time to market and agility are their key drivers of cloud adoption

451 Research 2019

As Rob Deakin, partner and UK head of digital at Capco, notes: "Infrastructure has historically been a necessary evil for banks, but thanks to cloud that is no longer the case. Why compete with Google's thousands-strong infrastructure engineering team when you can instead deploy their offering at a low cost and refocus your time and energy on real banking activities, product innovation and the customer experience?"

The cloud will be central to fostering the data-driven, innovative and above all customer-focused environment that large financial services organisations recognise as key to their future competitiveness, says Mr Lum.

"With cloud technology, banks can react quickly to changing dynamics while also remaining profitable," he explains. "If a bank wishes to target a particular demographic, they can build solutions, experiment and then scale much faster than on-premise systems would allow. That is a huge and vital differentiator in today's world."

Mr Lum stresses the importance of collaboration: "A critical distinction is that on-premise infrastructure is a walled garden, hindering innovation and collaboration. Moving outside those walls via the cloud opens up a more expansive ecosystem where collaboration is the norm."

An offering such as Starling's app store-style Marketplace is proof that partnerships and co-operation need not be a zero-sum game for the banking sector; rather they are very much the future. This is not simply down to an influx of new market entrants, however, but also due to legislation.

The UK last year saw the introduction of open banking, to be followed later this year by the implementation across European Union member states of the Second Payment Services Directive (PSD2). Both are designed to foster innovation and accelerate competition by opening up the client data held by banks to other providers.

Sharing this data with third parties has sparked concern in some quarters. However, it offers incumbent banks the opportunity to tap new revenue streams through connections with large technology providers and smaller fintech partners, capitalising on their new perspectives and brand power to launch new services, improve customer experience and, crucially, enter new markets.

As Jonathan Fenwick, UK head of digital engineering at Capco, says: "These platform businesses that seamlessly connect services to people, in the process making their lives easier, are ultimately the big winners. We see a number of financial organisations looking to build new services as platform models, and a cloud-based approach is key in enabling them to do this efficiently and effectively.

"The cloud is utterly transformational in that it federates empowerment rather than centralising it, as has traditionally been the case. It inspires an entrepreneurial spirit and is the reason why challengers can react to market developments so quickly."

Capco's own track record supporting established banks as they embrace digital solutions includes the launch of Mettle, the Royal Bank of Scotland's innovative small business bank. Mettle is designed around digital principles of speed, access and ease of use; for example, allowing customers to open a business current account more easily and quickly, forecast their business performance or create invoices from their mobile phone.

The growing ubiquity of the cloud, says Mr Deakin, will push technology much higher up the business value chain. On-premise technology is seen as the domain of specialist IT departments. Cloud technology by contrast offers a user-led and user-friendly experience, where impact and value are much more tangible and therefore more easily appreciated.

Yet, despite the undeniable benefits it offers, cloud uptake has been slow. As Mr Fenwick points out, a combination of security concerns, lack of in-house knowledge and the burden of systemic regulation has blunted widespread cloud adoption among banks.

"Early iterations of cloud technology did not place compliance at the heart of the solution," he says "For financial institutions, which operate in a heavily regulated environment and handle sensitive data, compliance is key, and on-premise technology was perceived to offer greater data protection and security.

"Banks have been hesitant to commit to a single cloud vendor and in any case there is no one-size-fits-all approach. Cloud providers are accordingly looking to make it easier for organisations to use multiple cloud services. It is also very likely that regulators will insist on a multi-cloud environment to reduce the concentration risk that comes with placing all your business with one provider."

Given the complex and monolithic infrastructures that underpin most bank operations, migration to the cloud is often approached with trepidation, as firms fear it will be hard to manage. Attitudes are now shifting, however. With challenger banks rapidly amassing market share, there is a renewed sense of urgency among established incumbents to transition to a more customer-centric, cloud-based digital business model.

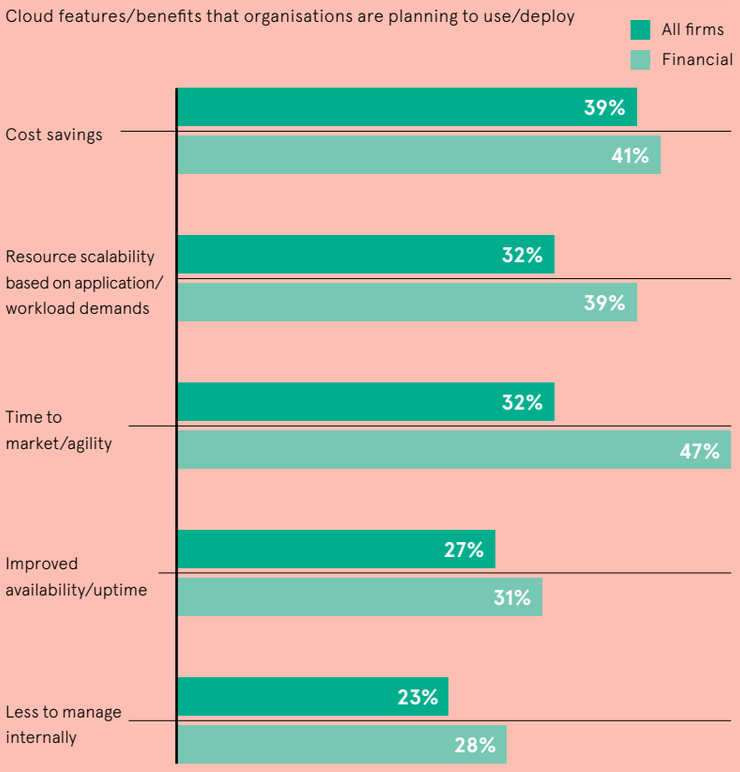
To maximise the potential of cloud-based solutions, financial institutions must adopt a cloud-first mindset. "Clients acknowledge there is a skills gap around the cloud, so it's about retraining employees, bringing in new talent, exploring new ways of working and collaborating with the right partners," says Mr Fenwick. "We often hear that technology has to understand the business, but the business must also understand how the cloud works to truly harness its benefits."

The onus is on banks to keep innovating and embracing change. "It may not yet be in their DNA, but the greater cost going forward lies in doing nothing," he says. "Certainly, migrating to the cloud is not without its challenges and will require a mix of strategy, knowledge and cultural change. In taking that step, however, banks will enhance both their customers' experiences and their own revenue streams, and redefine their standing in today's rapidly evolving financial services landscape."

For further information please visit www.capco.com

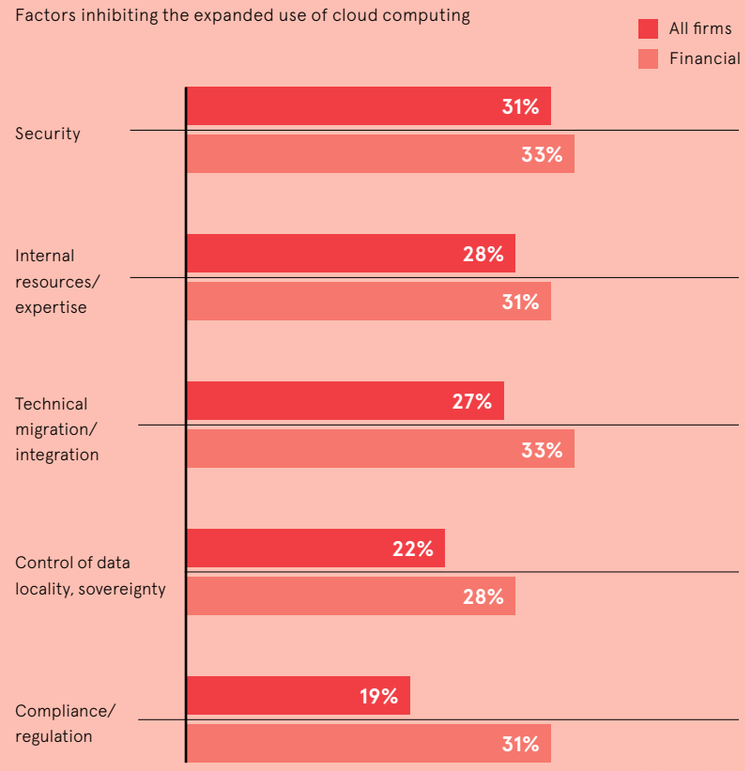
DRIVERS OF CLOUD ADOPTION

Cloud features/benefits that organisations are planning to use/deploy



INHIBITORS OF CLOUD ADOPTION

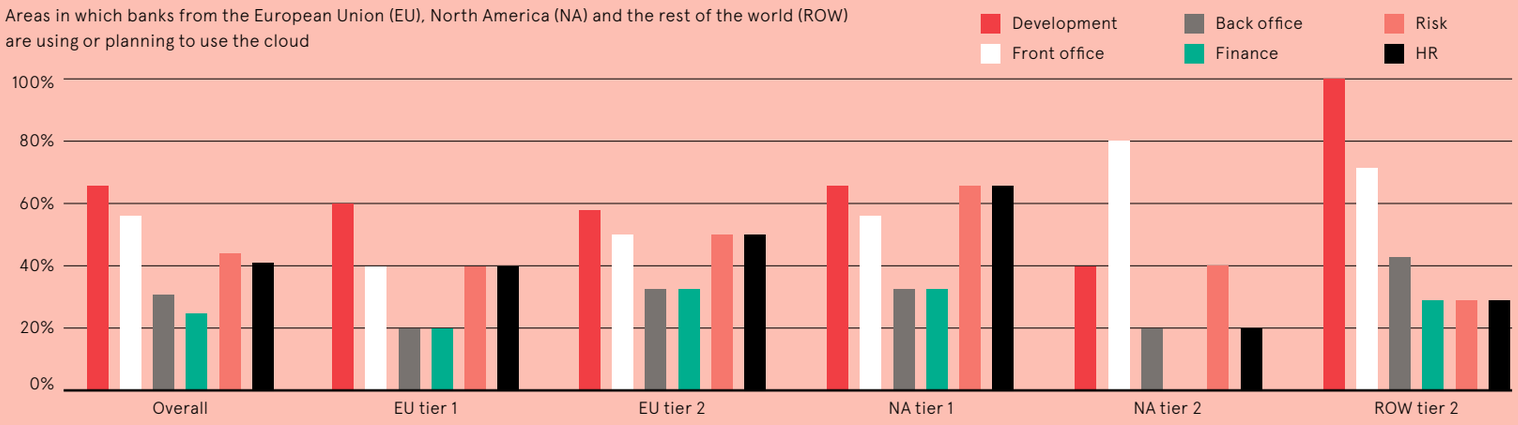
Factors inhibiting the expanded use of cloud computing



451 Research 2019

FUNCTIONAL AREAS

Areas in which banks from the European Union (EU), North America (NA) and the rest of the world (ROW) are using or planning to use the cloud



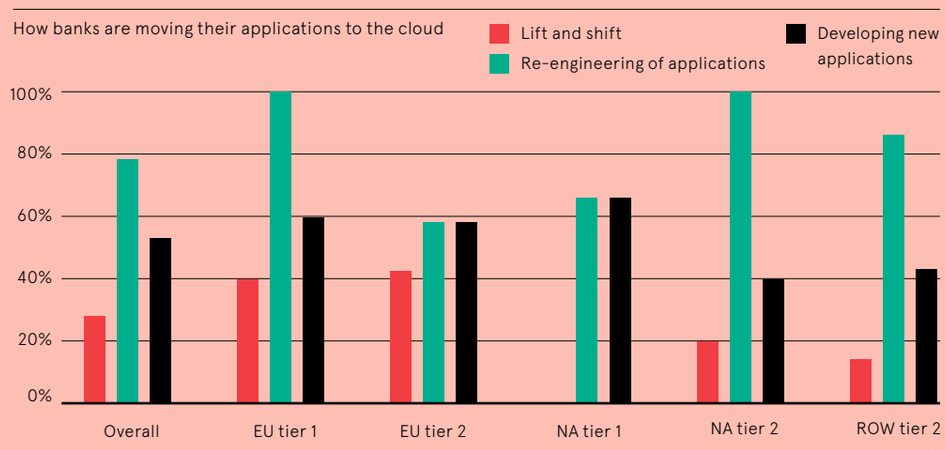
HTF Research 2018

CLOUD ADOPTION

Exploring how and where banks are deploying the cloud across their organisation, and the perceived obstacles along the way

MIGRATION STRATEGY

How banks are moving their applications to the cloud



HTF Research 2018

"With challenger banks rapidly amassing market share, there is a renewed sense of urgency among established incumbents to transition to a more customer-centric, cloud-based digital business model

Q&A

A question of digital disruption

Lance Levy, Capco chief executive, shares his thoughts on the future of banking

Q What are the main disruptors you are seeing within the banking industry?

A The banking industry globally is responding to an increasingly disrupted and turbulent business environment, and we expect this disruption to increase with time.

Many banks are coming out of a period of increased regulation and are subject to burdens around liquidity and some of the highest levels of scrutiny seen by any industry. Regulation in the shape of open banking and PSD2 is requiring banks to open up their client data, allowing tech giants and smaller fintechs to challenge their dominance.

The agility of these challengers, coupled with consumers' desire for greater transparency, flexibility and usability, is creating a gap between the banks that have embraced the digital future and those that haven't. Customers are now not only tech savvy, but also have a far greater understanding of what they want and what they expect from a bank, and the legacy business models of many incumbents don't meet these expectations.

Banks are asking themselves, "What is the risk of not moving?" At this point in the evolution of financial services, the race to stay relevant is very real and standing still is not an option.

Q With all this disruption, what are banks doing to innovate and apply digital to their working practices?

A Banks have realised they need to be looking at their business through a digital lens. In the past, technology was simply a cost centre but now, with new digital innovation, it is at once transformative and a differentiator.

The cloud, for example, has the potential to transform many of the core functions of banking, providing agility, scalability and power in cost-effective ways. It is also increasingly being seen by financial institutions as a risk mitigator rather than a risk multiplier as was previously the case.

The pressure to innovate will only increase as large tech firms make moves into the financial services sector. Big tech already knows how to use big data, analytics, artificial intelligence and machine-learning to maximise and personalise the customer journey.

Given the fierce competition in the sector, it's no surprise banks are refocusing on winning new business and strengthening their relationships with existing customers. As a result, we are seeing some established incumbents creating their own disruptors to challenge both themselves and the fintechs, RBS's Mettle being one such example.

Q How are banks transforming their legacy frameworks and infrastructure?

A The rate of change will inevitably be slower in larger institutions with significant legacy infrastructure, than in neo-banks. But a focus on technology is only half the battle; for banks to fully realise the potential of digital, digital transformation needs to be much higher up in the value chain, and this includes looking at broader working practices and corporate structures.

The workforce will be a major deciding factor in determining the success of digital transformation. Building diverse teams and upskilling existing workforces, as well as recruiting employees, particularly Gen Y, with digitally native skills and experience will be key to fostering innovation. With the right tools and knowledge, the workforce is better placed to build the optimal digital experience both inside and outside their organisations.

This combination of emerging technologies and new ways of working will be a critical combination that will set market leaders apart from the rest of the field.

Q Do you think banks and fintechs can co-exist happily?

A The relationship between the two is changing. Each side has a different focus and different strengths, but we are starting to see symbiotic relationships forming. As I mentioned, some banks are launching their own challenger brands, while others are taking on the features and the working practices of startups.

We are increasingly seeing greater collaboration between the two groups as banks and fintechs look to draw on each other's strengths to create new marketplaces for consumers that bring together innovative financial services on the one hand, and products from established and trusted brands with long-held relationships on the other.

Q Importantly, who will be the winners in all this?

A The costs of maintaining and upgrading infrastructure, along with a desire to keep abreast of customer expectations, means banks are increasingly embracing innovative digital technology. For banks, this creates cost efficiencies, flexibility, new deployment models and accelerates the pace of change.

For the customer, the news is equally positive, with the banking model pivoting towards an enhanced customer life cycle and user experience. With all this talk of technology, it is easy to forget that banking, when all is said and done, is still a relationship business. It's all about people, which is where the personalised, high-touch elements of a digital offering come to the fore.

As more businesses move to the cloud, and as technologies such as blockchain become more prevalent, we will see increasing connectivity and collaboration that allows disparate organisations to work together in ways which reinforce co-operation and build mutual trust. This will ultimately be what shapes the future of banking.

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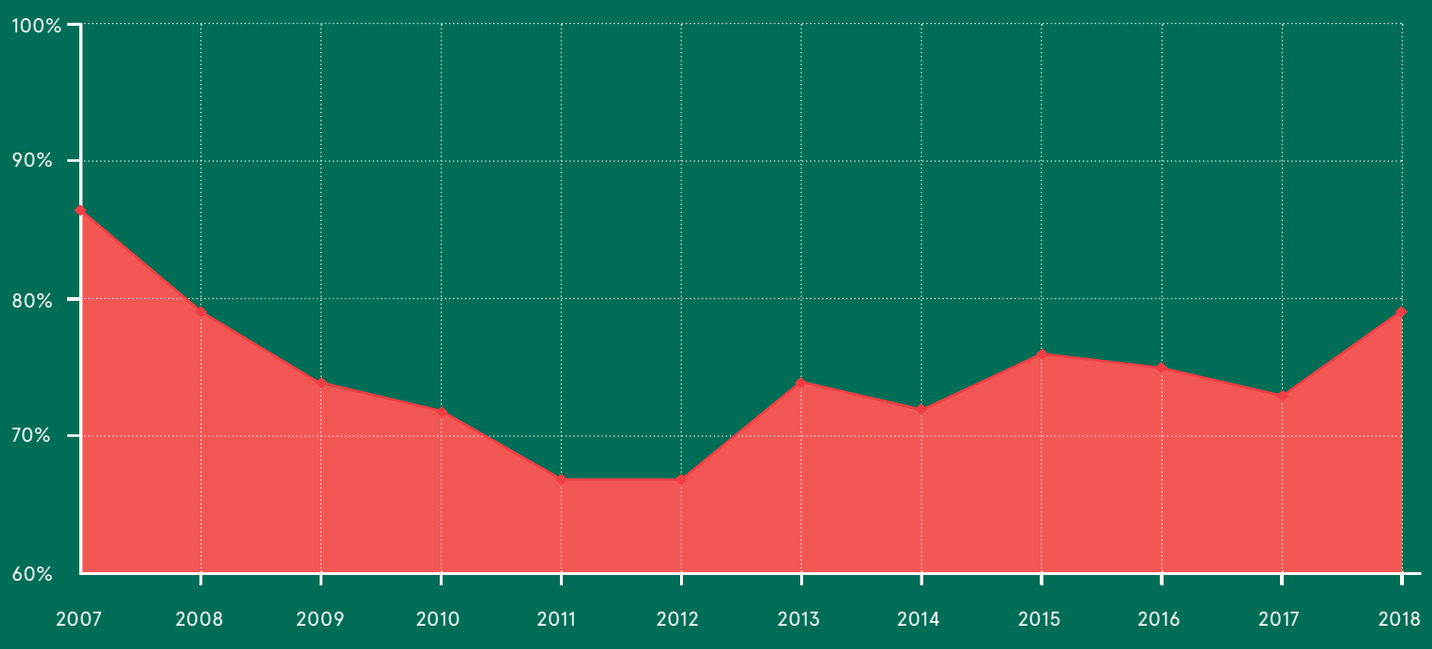
THE TRUST IMPERATIVE

Trust has recovered slightly since the recession, but customers are still wary and financial services companies have a lot to lose if they cannot allay fears over privacy and security

TRUST IN BANKS IS ON THE UP

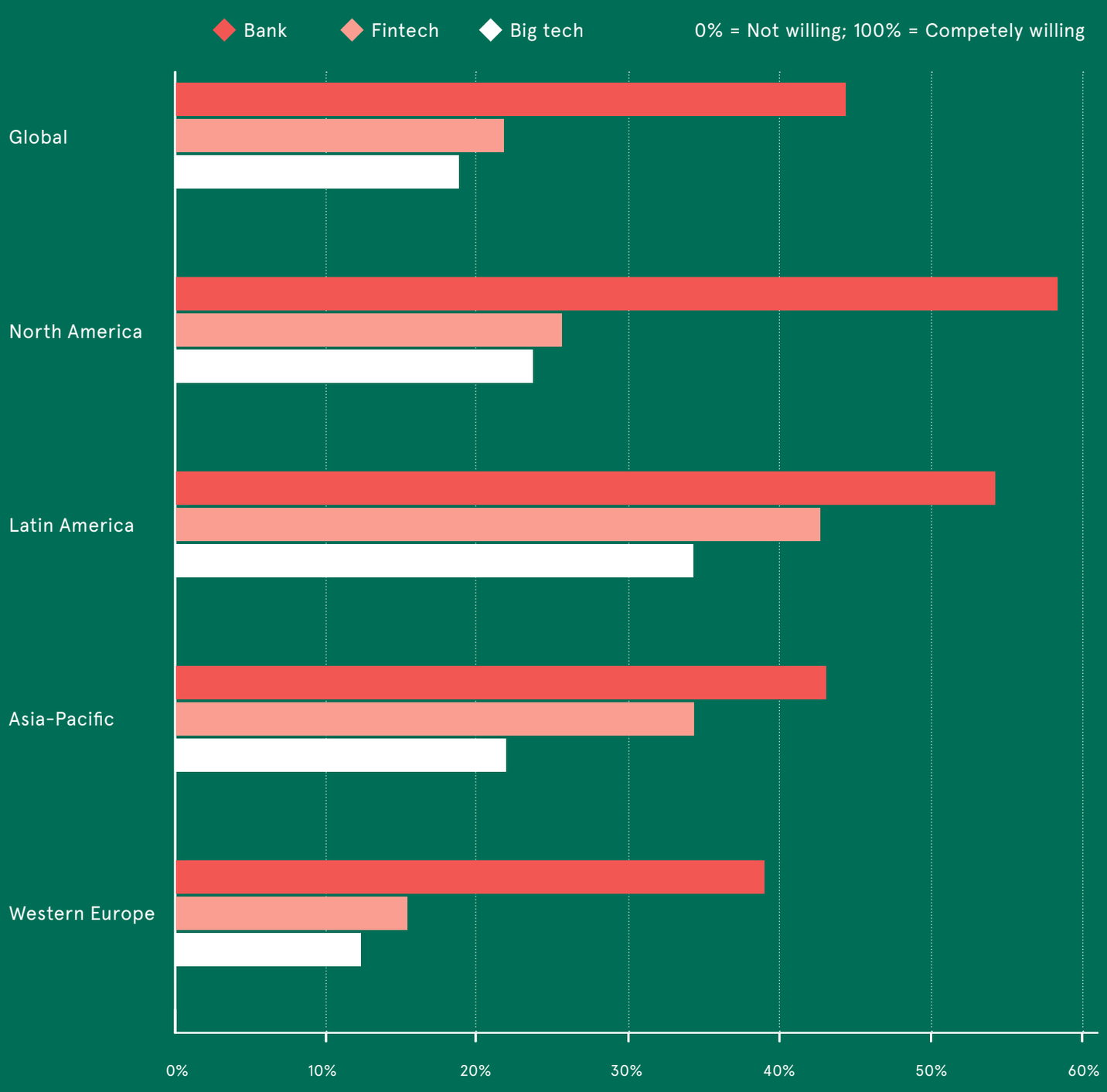
Percentage of consumers who trust in banks



Gallup 2018

THE EXPLOSION OF BIG DATA AND ITS INSIGHTS MEANS TRUST IS FUNDAMENTAL TO STRATEGIC ADVANTAGE

Customer willingness to share personal data with financial services entities, by region



Capgemini 2018

74%

of millennials are willing to share personal data with banks, compared with just 49 per cent those aged over 55

Capgemini 2018

TECH IS CRUCIAL TO SUCCESS FOR FINANCIAL SERVICES COMPANIES

Factors that would increase consumer trust in a financial services company

Edelman 2018

TRUST IS OUTRANKING PRICE AS AN INFLUENCER FOR CUSTOMERS' CHOICE OF BANK

Top five factors influencing customers' decisions to choose a bank

47% Ease and convenience of service

45% Trust with the brand

43% Price/rate

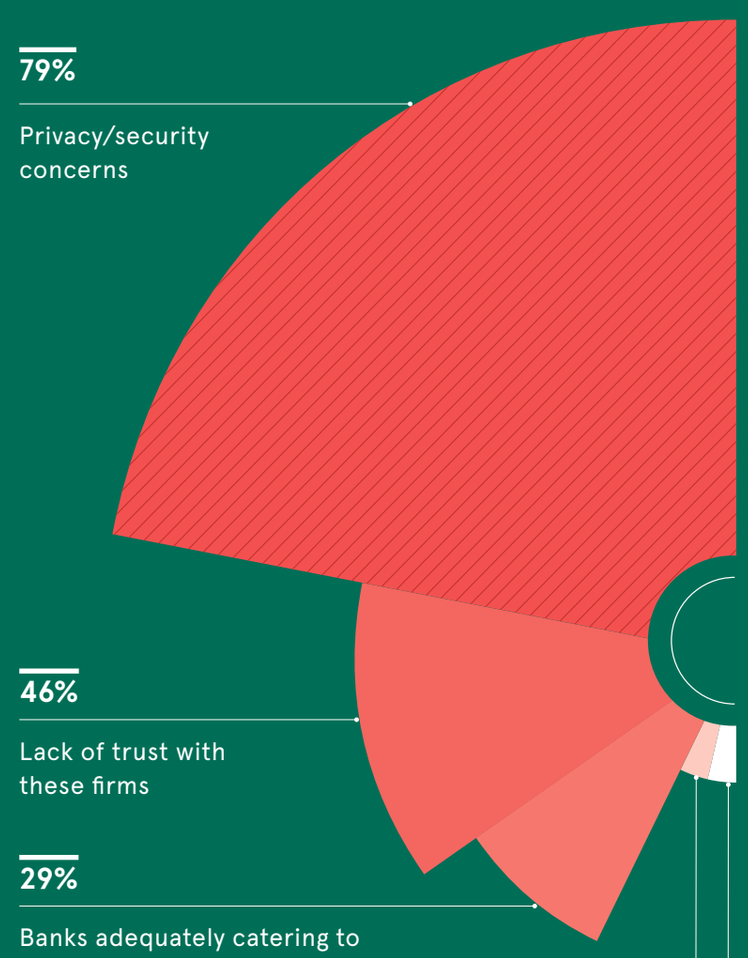
43% Service resolution quality and timeliness

40% Wide network coverage of ATMs

Capgemini/Efma 2018

EVEN BIG TECH IS RESTRICTED BY A LACK OF CUSTOMER TRUST

Most important factors deterring customers from big tech's financial services, according to senior banking executives worldwide



Capgemini/Efma 2018

DIGITAL

Digital banking or banking done digitally?

Big banks understand they must 'go digital' to survive – but do they really understand the true potential of digitalisation?


Justin Lambert/Getty Images

Duncan Jefferies

Digitally savvy startups have changed everything from the way people travel to how they order their takeaways. But until recently the financial industry seemed somewhat untouched by the waves of disruption crashing down on other industries.

Strict regulations stopped would-be entrepreneurs from entering the market and many of the big banks seemed content simply to shift their basic services online in a kind of "will this do?" approach to being a digital bank. Then, suddenly, everything changed.

Governments and regulators actively began to encourage the growth of the fledgeling fintech industry, and a number of digital-only challenger banks emerged. The likes of Monzo, Starling Bank and N26 offer customers slick apps and speedy service. They aren't held back by the complex legacy IT systems most big banks have to wrestle with to rollout new digital products.

And they're particularly attractive to the kind of young, millennial customers that represent the future of the banking industry.

However, despite initial predictions that challenger banks would usher in the kind of disruption that's fundamentally changed, say, the music and retail industries, the picture is more nuanced.

"The term disruption has been used a lot," says Michal Panowicz, senior global digital transformation expert for the Boston Consulting Group and former mBank executive. "But in some ways the disruption hasn't arrived, even to the extent that many boards of large banks have become desensitised to the topic."

Although slick apps and personalised spending alerts are appealing to many, the big banks have largely retained their vast customer bases. That's partly down to people's wariness about entrusting their primary account to these startups, as well as the limited range of products on offer.

In other words, traditional banks still have a chance to capture the market that challenger banks seek, but they'll need to move beyond simply offering old-style banking services on new digital channels.

"We're seeing people with quite large aspirations spending billions of pounds and not really achieving anything," says David Brear, chief executive and co-founder of fintech consultancy 11:FS, which has the motto "Digital banking is only 1 per cent finished".

Indeed, few would argue that banks need to speed up their efforts dramatically to become truly digital. But Mr Brear says the problem is often more cultural than technological. "In any organisation we've been too, there are groups of highly motivated, smart people who know what to do," he says. "But it's about unleashing and unlocking that potential."

At any rate, simply pouring millions into innovation hubs and piecemeal digitisation strategies isn't going to deliver the kind of results that will win over those tempted by the challengers' offerings or indeed the financial services big tech firms such as Apple, Google and Facebook increasingly offer. Yet upgrading convoluted core banking systems designed for a branch-based world can take years and cost billions.

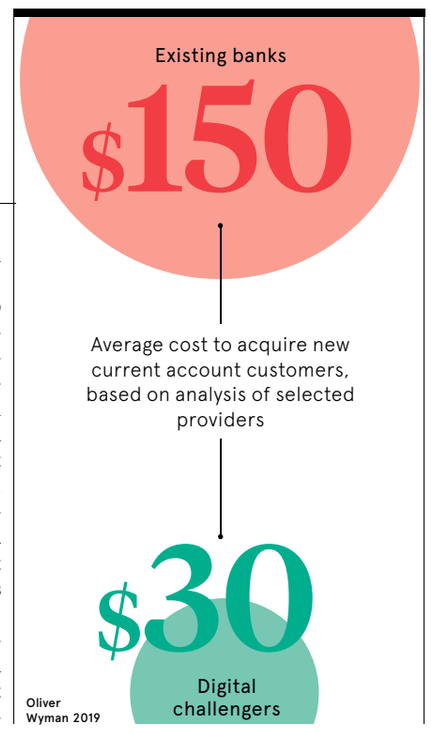
> **We have the expertise and experience in navigating challenges, and in answering the hard questions**

One way around this is to create your own challenger bank, something that as many as one third of retail banks are looking to do, according to recent research by the Economist Intelligence Unit on behalf of Temenos.

"If you really want to move forward quickly, basically the only option is to set up your own challenger bank," says Peter-Jan van de Venn, managing director of business development at Five Degrees, a Dutch fintech specialising in digital core banking software. "I've seen that happening among our own clients and it's proven to be quite a successful approach."

These challenger banks effectively keep customers in-house and can be established in as little as 12 to 18 months. NatWest, for instance, recently launched Mettle, an app-only bank which offers small and medium-sized enterprises combined current account, invoicing, payment chasing and bookkeeping capabilities. Its Esme Loans lending platform, meanwhile, provides business customers with a paperless loan application process that takes less than ten minutes, with funds often received within the hour.

As well as offering faster services, NatWest also aims to provide customers with seamless interactions across different channels. In the future, artificial intelligence and machine-learning could even drive highly personalised and timely product offerings based, for example, on a customer's location or spending habits.



"We're reimagining what it is our customers actually want, as well as how those services are going to be provided," says Kevin Hanley, director of innovation at NatWest.

Banks that don't want to go down the challenger route can still enhance their approach to digital by embracing open banking through APIs (application programming interfaces), software which allows fintech firms to build tools and apps on top of the bank's core technology infrastructure. This effectively repositions the bank as more of a technology platform for services offered by third parties.

"The successful organisations in future will be those that are able to combine their assets and services with the assets and services of others, and do new and unique and insightful things that are valued and trusted by customers," says Mr Hanley. "And that's a fundamentally different kind of banking landscape to the one that has existed for the last three, four or even five hundred years."

Commercial feature

New and improved nerve centres of high finance

Automated software solutions can liberate compliance control rooms by collecting and highlighting a wide range of critical information

Control rooms are intense environments. They're the nerve centres of big financial institutions, funnels through which all deal-related data must pass to be organised and analysed.

The teams of people doing this analysis are painfully small; typically five or six people, who must rigorously monitor the activity generated by thousands of deals simultaneously in motion.

And these already intense environments are just getting more intense as complexity in day-to-day firm operations and regulatory pressure are on the increase. But complexity can mean chaos, which can result in lost deals, if they aren't cleared quickly enough, and lost reputations, if conflicts result in regulatory action.

New technology is set to change all this and the notion is evoking an enthusiastic response from the beleaguered compliance staff working these high-pressure jobs.

This gets to the heart of the matter: given the importance of control rooms, there's been surprisingly little investment in the kind of cutting-edge software that could ease the manual burden on control room teams and really help improve this critical compliance function.

Money has been spent on know your customer or anti-money laundering systems, yet at some of the biggest firms, compliance control rooms are still run using email chains and spreadsheets.

Proper monitoring means being able to record a range of information, from material non-public information, to unpublished price-sensitive data, to conflicts of interest among trading staff, to research notes from analysts.

Frankly, Excel just won't cut it anymore. The answer, like with so much else these days, is software: automated solutions which can collect and make visible a range of important information.

Well organised "watch" and "restricted" lists are also critical to an effective control room, but all too often the sheer quantity of data is overwhelming. Software can help keep these lists current and the flow of data manageable, and therefore keep a bank's dealmakers competitive and the company on the right side of regulators.

In today's global village, financial companies may be geographically dispersed, but regulators around the world are converging, with similar legislation in different countries aiming to stamp out poor or unethical behaviour.

There's a growing challenge from regulators, whose political masters are keen to demonstrate that lessons have been learnt from the scandals and crises of the past decade, to detect insider trading or breaches of information originating from research departments. And they're increasingly willing to make an example of any company that fails to meet their high standards.

Letting control room teams try to do so with outdated systems or inadequate investment is a serious risk to the future of any financial organisation. Control room software needs to integrate seamlessly with other systems, such as trade order management and employee compliance.

It needs to be able to plug into client relationship and human resources data. It needs interfaces that are user friendly and intuitive. It needs to ensure tasks don't get stuck in a compliance dead end, limiting the activity of traders and analysts. It must provide a clear audit trail, and be able to demonstrate efficient and effective decision-making, not only to the board, but also, if necessary, to the regulator.

Technology provides the perfect solution to the complex and intense needs of the modern financial compliance control room. StarCompliance is one of the few global compliance software solution providers working to address this burgeoning need for a comprehensive control room product.

Deal complexity and regulatory scrutiny may be on the rise, but solutions like Star's Compliance Control Room go a long way towards enabling control room teams to clear deals faster with less risk, all from a single platform, and in the process streamline the entire compliance control room function.

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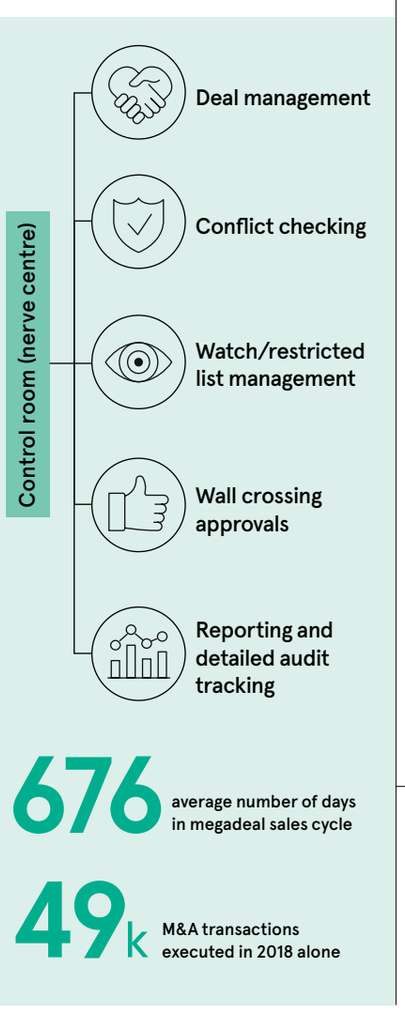

676 average number of days in megadeal sales cycle

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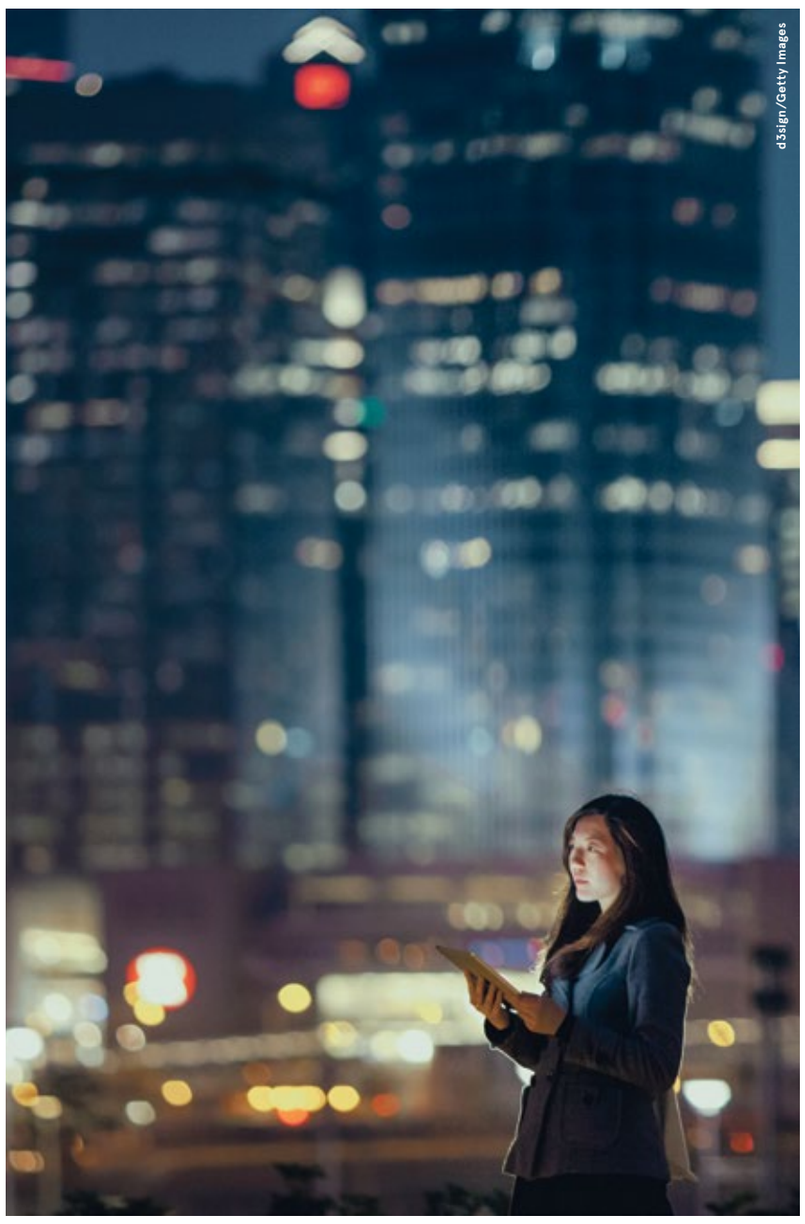
STAR COMPLIANCE

INTERNET OF THINGS

Banks will need to live life on the edge

Edge computing, where computing power shifts away from centralised networks and processing data happens closer to source, is set to propel banking services and operations into the future


d3sign/Getty Images

Matthew Staff

As the number of internet of things (IoT) devices glides past the one billion mark globally, the need for banks to target mobility as a strategic priority has never been greater. And partnering new 5G capabilities with edge computing is likely to be chosen method to do so.

By 2022, 50 per cent of enterprise-generated data will be created and processed outside of datacentres or the cloud, according to Gartner, and by 2025 the number of IoT devices is likely to have reached a staggering 100 billion. Improving speed of service and reducing latency is the only way to mitigate challenges of increased data at the edge.

However, living life on the edge may be more of a natural transition for the finance industry than it initially seems.

"Financial institutions have a long history of edge computing, although it may not have been classified as that in the past," says Stephan Fabel, director of product at Canonical, the company responsible for the Linux operating system behind Ubuntu.

> **[Edge] enables use-cases such as robotics, computer vision and machine-learning to impact the end-user directly**

"ATMs, banking apps and stand-up branches have all previously incorporated elements of edge processing. Reducing the cost associated with maintaining these edge sites, therefore, will be a key factor in driving more holistic edge solutions, especially with financial institutions managing global fleets."

Mr Fabel pinpoints bring-your-own-device or BYOD banking, the prevalence of banking services outside of the traditional bank and the vast amounts of data being processed outside datacentres as additional contributions to the overarching demand for reduced latency and improved edge cloud solutions.

"Only by reducing network latency can the next generation of customer-facing services be realised within bank branches, at ATMs and point-of-sale services," he adds.

"There are examples of financial institutions already adapting and incorporating better infrastructure to support such new ideas, however. Take Capital One's new cafés, for example, which allow expert banking systems to be accessed remotely, including the determination of credit worthiness, loan applications and fraud detection."

Canonical's history of model-driven operations has long assisted scaling challenges associated with edge deployments. The company, and Mr Fabel himself, have therefore seen first-hand how edge computing can bring power closer to the customer and how pivotal this notion is for the financial services industry.

"It enables use-cases such as robotics, computer vision and machine-learning to impact the end-user directly, both to enhance the experiences they're already accustomed to, like in-store or in-bank offerings, but also those that have not yet been realised," he says. "The investment arm of banking, in particular, will look to capitalise on this opportunity, using advanced analytics, enabled by artificial intelligence and machine-learning, to process huge amounts of data on the edge, and better predict market behaviours."

To capitalise on and adapt to the trend, Ravi Naik, chief information officer and senior vice president of corporate strategy at Seagate Technology, agrees and emphasises the key word to focus on is "data". Mr Naik believes only by focusing on the flow, security and provenance of data can the financial sector truly engage and orchestrate within existing means of regulated business sectors.

"As financial institutions transform their business models, there is an increased need to adopt distributed data models," he says

If harnessed effectively, "we believe there are three main disruptive opportunities with the edge", he continues. "Intelligence translating to improved and tailored customer experience; backhaul avoidance using white-box commodity hardware to virtualise the network and allow for infrastructure to scale cost effectively; and the ability to containerise applications and bring CI/CD [continuous integration and continuous delivery] and agile software development into multi-tenant environments."

Regarding orchestration, the sector could do a lot worse than to follow the Commonwealth Bank of Australia's lead and learn from the telecommunications industry's own transformation to incorporate 5G networks.

"Cloud-native deployments for next-generation banking services, those available at edge sites or 'micro-branches', bring an expansion of infrastructure platforms most frequently seen in a telco context," says Mr Fabel. "High resolution data, for example, is increasingly captured at the edge, before being transformed for suitable transmission to a central cloud. After that, even more compute-intensive processes are undertaken."

To manage this complexity, hyperscalers and telcos are looking at cloud-native and micro-service-based application deployment patterns and the containerisation that comes with them.

"In short, it is flexibility at the edge which is the most important aspect of any edge roll out, for telcos or banks," says Mr Fabel.

Mr Naik agrees, alluding to this flexibility's influence on overall customer experience. "Digital technology is the primary way in which stand-out customer experiences are delivered," he says. "Choosing or changing a financial services provider is easier than ever before and a misstep in customer experience can leave long-term relationships at risk.

"Edge computing is, in its simplest terms, a way of ensuring data gets to where it needs to go faster, more reliably and, most importantly, more securely than before. This will become a key component for financial services firms that are not only looking to deliver the experiences many customers have come to expect, but are ultimately stewards of their customers' most private data." ●

Olga Kashubin/Shutterstock

Commonwealth Bank of Australia

At the 2019 Mobile World Congress in Barcelona this February, financial services' foray into the realm of edge computing was given a significant nudge courtesy of the Commonwealth Bank of Australia.

An announcement at the event confirmed that, in collaboration with tech giants Telstra and Ericsson, 5G edge computing would be trialled and explored as the first venture of its kind in the sector.

"The trials are expected to showcase what the bank branch of the future might look like and how 5G edge computing can help to reduce the network infrastructure currently required at individual bank branches," Telstra says.

The telco adds that the trial's intended outcomes would be to "explore optimal 5G coverage solutions and provide more flexibility for bank operations and locations".

The Commonwealth Bank of Australia echoed these sentiments from the perspective of enhanced customer service. Levels of availability, stability and performance of the bank's network infrastructure were all listed as part of its now 5G and edge computing-driven ambition to provide a more complete digital experience for customers.

"5G edge computing is all about bringing the network closer to the user or application," according to Nikos Katinakis, Telstra's group executive for networks and IT. "For financial institutions like Commonwealth Bank, it will help to enhance existing banking applications as well as deliver new use-cases such as artificial intelligence, all supported by a range of software-defined networking solutions."

Commercial feature

Q&A

The thinking behind Thought Machine

Banks are struggling with archaic systems. There is an alternative. Thought Machine offers a complete banking system, built with cutting-edge tech. Founder **Paul Taylor** explains why his concept is in high demand

Q Why did you found Thought Machine in 2014?

A Banks have been suffering from the effects of legacy IT systems for years. They found themselves marooned on platforms which are difficult to maintain and upgrade. The software is often ancient and fragmented. The IT staff can barely cope. Customers feel the effects when there are unplanned outages or systems need to be taken offline for maintenance. To put it bluntly, banks don't provide the online or digital experience that customers expect. So we at Thought Machine took a different approach and built a new banking platform entirely from scratch. Our platform is free from legacy problems. It gives banks a more resilient and modern platform upon which to base their online offerings.

Q Talk us through your product

A Our platform is called Vault. It runs in the cloud. It is highly configurable and can run all the products you normally associate with a bank, from current accounts and mortgages, to loans and credit cards. Many of the senior team in Thought Machine were previously at Google where we learnt how to solve many of the problems that all large systems face. We put this experience into Vault, which gives a number of advantages. Vault can be upgraded while it is running, for instance; no more Sunday mornings when you can't do online banking. It has security baked into the system, so customers don't have to worry about data leaks. It is incredibly resilient because the system runs in multiple datacentres at the same time. This means an entire datacentre can go offline without any disruption in a customer's online activity. It's a massive leap forward.

Q How hard is it to deploy?

A We can deploy a complete, new bank in a few hours. After that, banks configure Vault for the range of banking products and customer experience they want. Many of our customers are building completely new online banks, with no legacy systems to think about. These are normally very quick for customers to onboard and get started. Established banks, sometimes with millions of customers, are replatforming. This involves building a new bank on Vault and moving their existing customers on to it. The customers can continue using their banking services without disruption, but now on a new platform. From that point on, the bank can innovate far more quickly and provide new services impossible to imagine in the old world.

Q How did you win the Lloyds Bank contract?

A We started working with Lloyds Bank a few years ago, following an introduction by Jason Bates, founder of 11:FS, the well-known digital banking consultancy. We began with a simple proof of concept and then moved on to proving more and more parts of a bank, such as regulatory reporting, time taken to create new accounts, resilience and so on. It has been a great journey for both us and Lloyds. We've learnt about the nitty-gritty of banking. Lloyds is learning about what banking in the cloud can really look like and what advantages can be achieved. Near the end of 2018, we took investment and agreed a long-term partnership, with the aim of putting some of Lloyds' customers on the platform and giving them access to all the advantages we've just discussed. We signed a partnership with Atom bank in 2018 as well. Atom is one of the UK's fastest growing challenger banks and our partnership gives Atom the ability to move as fast as possible in the new digital banking world. We have many more banks going live on our platform in 2019 and 2020.

> **Our ambition is to build a genuinely global tech company, selling to thousands of banks and solving the problem of banking technology for ever**

Q In the long run, what difference will it make to banks if they are based on the Thought Machine platform?

A I point to four major advantages. First, security. Everything is encrypted and data is safe from security breaches. Second, flexibility. Banks can easily launch whatever apps and banking products they want. Third, scalability. The cloud gives banks the chance to have huge customer numbers and transaction volumes. And finally, cost. We can run a bank at the fraction of the cost of a traditional system. As all costs are eventually passed on to the customer, this is a huge win for everyone.

Q Banks want to offer third-party services via open banking. Do you make this easier?

A Using APIs [application programming interfaces] is a must-have for any new banking system and of course we provide this. The days when banks owned and built all their technology from top to bottom are gone. Far better to have a best-of-breed policy, where the people best able to provide apps and services can do so, and link to banks in a safe and secure way.

Q What new products are your Labs team building?

A Thought Machine Labs is the experimental arm of Thought Machine. While much of what we do is infrastructure work, we want to show banks how banking experience can be. Every year, we create a small number of new apps which help people imagine and use finance in a different way. We have games apps that help people with saving, apps which show the effects of good financial health and apps which provide highly customised products for individual users. We license these concepts in an exclusive way to a select number of banks.

Q What is the future for Thought Machine?

A It is an exciting time at Thought Machine. We have more than tripled the size of the company in the last 12 months and are now at 170 people. Customer demand is so strong that we will double to the company again by the end of 2019. Right now, I'm in Singapore setting up Thought Machine Singapore; the level of interest here is amazing. Soon we will be setting up in North America.

Our ambition is to build a genuinely global tech company, selling to thousands of banks and solving the problem of banking technology for ever. While Thought Machine's future is as a global company, I am proud to have founded the company in London. It is another mark of success for the London technology scene that it is now not just known for its vibrant startup scene, but is becoming known for rapid growth scale-up companies also.

To find out more please visit ThoughtMachine.net

Thought Machine

INNOVATION

Smoothing friction with fintechs to unleash innovation

The arrival of open banking has thrown together fintechs and legacy banks, but do these organisations make good partners?

Joe McGrath

On the face of it, traditional banking and fintech are not a natural fit. But with high street banks hindered by legacy technology, they are having to place increasing trust in fintech investments.

Many of the banking giants have partnered with or in some cases even acquired fintech businesses in a rapid bid to roll out more innovative products and services.

However, the relationship between fintech and banking can be far from harmonious. The two types of business are used to being competitors, while the differing cultures can clash when risk-taking fintechs are brought in to work with risk-averse banking institutions.

> **Fintechs often build the product, with their own money and risk appetite. Once in production, the risk banks take is much reduced**

Anthony Morrow, chief executive of digital financial advice service OpenMoney, says: "Smarter, savvier mainstream banks have woken up to the fact that fintechs could help facilitate a much better service to their customers.

"But bringing together two businesses is never going to be easy and the challenge is even greater when you are combining a cutting-edge fintech with a traditional legacy bank.

"It can sometimes be hard to maintain the nimble culture of a startup when it comes head to head with the governance and administration challenges of bigger companies. Tension can often result."

Ian Henderson, chief executive of AML Group, sees the large banks as constrained by rigid, hierarchical structures, as well as regulation. "Fintechs can behave more like loose networks: open, collaborative, agile," he notes.

In Mr Henderson's experience, these approaches are largely incompatible and he claims putting a fintech into a large bank is a good way of destroying its value, although he suggests ringfencing joint ventures can sometimes work.

There are those from both the fintech and banking worlds who contest this view, including Paul Taylor, founder and chief executive of Thought Machine, a fintech that received an £11-million investment from Lloyds Bank last November to help with digitalisation at the retail bank.

66%

of fintechs say they partner with an established brand name for enhanced visibility

Capgemini 2018

"We've found that all the banks we work with have put a huge amount of effort into making the projects work," Mr Taylor insists. "They know change has to come and doing projects with fintechs is one way of pioneering this change."

Rather than tensions existing between the entrepreneurial, risk-taking culture at fintechs and legacy banks, he believes there is a "symbiosis".

"Neither party wants technology that breaks or is unsafe," he says. "Fintechs often build the product, with their own money and risk appetite. Once in production, the risk banks take is much reduced."

HSBC is working with hundreds of fintechs to help bring new ideas and improve the customer experience at the retail bank, according to Josh Bottomley, global head of digital at HSBC Retail Banking and Wealth Management.

"Of course, we have to manage this in a safe way for our customers and a good example is our First Direct partnership with Bud, where together we tested the 'artha' app in the FCA [Financial Conduct Authority] regulatory sandbox," he says. "We're now working to integrate the features from that trial into our own app."

Tension does not have to be detrimental and for some businesses, it can even help aid the innovation and development process.

Andrew Beatty, senior vice president of global banking at FIS, thinks tension and collaborative conflict is natural, but that ultimately mutual respect should prevail.

To achieve this, he suggests fintechs should seek and respect the financial institution's expertise regarding financial services requirements.

"Both parties must apply constructive criticism appropriately," he adds, noting that fintechs should also be confident in their vision and direction.

"The fintech should not blindly accept all requested changes from the incumbent bank, which could quickly take both parties off course and threaten the traction needed to progress in the engagement," says Mr Beatty.

There are signs that open banking is helping ease the strain between traditional banking groups and fintech companies that are trying to work together.

Open banking has led to two key changes in the marketplace, according to Harpreet Singh, executive director at Brickendon, a financial services consultancy firm.

"Firstly, fintech firms are utilising the available data and providing better insight in the areas of analytics, leading to swifter processing and more efficient services," he says. "Secondly, this has pushed banks to provide similar services while maintaining the impression of a robust, secure and safe environment."

For Moneyhub's chief executive Samantha Seaton, implementation of open banking has fundamentally changed the relationship between banks and the burgeoning fintech community.

"Establishment players that had been slow to implement technological change were forced to confront their tech inadequacies," Ms Seaton notes.

But she also points to an ongoing "cultural mismatch" which, she says, is causing friction, as banks remain wary about embracing technologies that pose a challenge to their long-term dominance.

Ms Seaton explains: "This was made public in April when the Competition and Markets Authority felt it necessary to issue directions to five banks in respect of the Retail Banking Market Investigation Order 2017.

"The concerns raised related to delays in delivering certain aspects of the open banking programme, in particular with regard to mobile app functionality."

So, what does the future hold for the working relationship between banks and fintechs, and will either of these two very different organisations be prepared to adapt?

OpenMoney's Mr Morrow warns that the sheer quantity of new entrants to the market, helped by easy access to venture capital, means there are "too many copycats around".

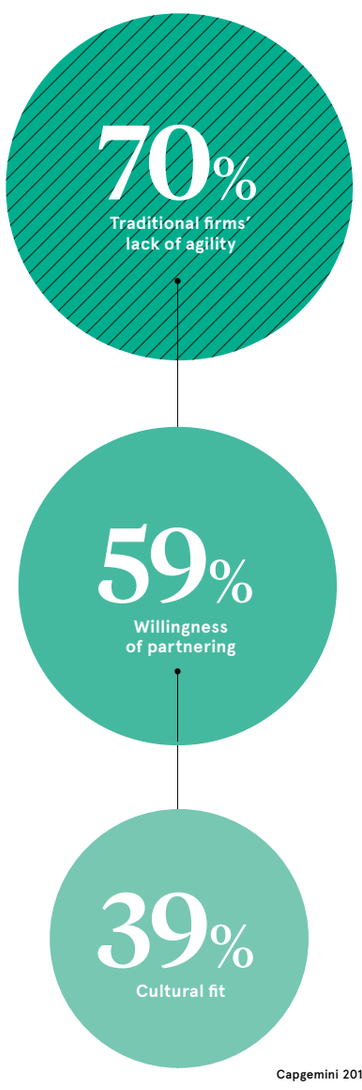
He urges "something different" from the banks and fintechs. "Without this, it's unlikely the bigger banks will see any merit in partnering with fintechs and they will instead remain stuck in their rigid ways, missing out on what could be something really special," he says.

Yet Claire Bright, chief financial officer and head of strategy at DAG Global, sees the relationships between banking and fintechs becoming more blended, "as each side sees the benefits of working closer together".

However the relationship develops, there are going to be bumps along the way. For Stuart Bungay, chief executive and co-founder of money management startup Tully, it requires change on both sides. Fintechs will need to invest more in risk and compliance functions while "to really push innovation and engage with fintechs, banks will have to create specialist teams who can engage quickly and easily on a proof-of-concept basis", he says.

TOP THREE CHALLENGES FINTECHS FACE LOOKING FOR A PARTNER

Global survey of fintechs



Capgemini 2018

BANKING MODELS

Five ways tech is challenging traditional banking models

The traditional banking model that has served financial institutions for centuries is under fierce threat. But while any one company's greatest rival used to be found within its own industry, that's no longer necessarily the case. As big tech continues to boom, they're hustling to transform themselves into sector-straddling giants with the world of finance in their crosshairs, and capitalising on the emergence and popularity of a platform economy

Josie Cox


Rodion Kutsaev on Unsplash

Mobile

he likes of Atom Bank, Monzo, Starling and Revolut, which represent the intersection between finance and technology, have capitalised on consumers' waning trust in the traditional banking model, partly borne out of the 2008 financial crisis.

The so-called challenger banks have been quick to recognise savers' appetites for a digital-first banking experience, where they can do everything seamlessly from their mobile phones.

According to research conducted by the analytics firm CB Insights, mobile accounted for just 13 per cent of customer banking engagements in Europe in 2011. But the bold bet these new players made at the time of their launch that mobile would become the dominant platform for retail banking distribution, has unquestionably paid off. By 2016, mobile customer banking engagements across Europe had risen to 56 per cent and that proportion continues to swell.

Established banks with a retail arm now all have mobile offerings and many are sophisticated, but the majority still require face-to-face contact for certain services, such as opening an account. Their pivot to digital is not complete. As customers become less inclined to visit physical bank branches, mobile-first alternatives are cementing their hold on this segment of the market.

In China, as of late last year, Alipay and WeChat were believed to have more than 1.3 billion mobile payment users and accounted for 94 per cent of that market by some estimates, representing one of the most prominent threats to traditional banks.

Piotr Swat on shutterstock

Agility

The digital-first strategy inherent to many fintech businesses also means they're agile and can provide swift customer service. This is of great value in a world where consumers have become accustomed to a platform economy and expect instant gratification, through the availability of next-day delivery and on-demand entertainment.

Big tech companies, meanwhile, with their vast financial resources and strong brand loyalty, have the firepower to be more experimental in their approach, thereby putting pressure on the traditional banking model.

Apple earlier this year announced it was teaming up with Goldman Sachs to launch a credit card linked to its Apple Pay service. While demonstrating Apple's appetite to explore and attempt to disrupt new markets, it exemplifies how big banks are being forced to respond to the changing world of consumer finance, as well as big tech's ability and clout to reinvent themselves across a range of industries.

In 2018, Goldman Sachs launched Marcus, a digital retail bank, to head off the competition from fintech startups and tech companies. Royal Bank of Scotland recently snapped up a 25 per cent stake in Loot, a startup that aims to help young people save. A digital bank called Bo is currently under development through RBS's NatWest brand and is slated to launch later this year.

"Digital disruption has changed every industry and will continue to do so," says Jo Hannaford, head of technology at Goldman Sachs for Europe, Middle East and Africa.

Recruitment

Graduates' priorities have changed when it comes to choosing an employer. Over the last decade since the financial crisis, those entering the workforce have increasingly come to value purpose over pay.

Lovell Corporation, a Canadian marketing company, published research in 2017 that found Generation Z – those born between the mid-1990s and early-2000s – to be a generation of "change-makers". The top career choice for this demographic in the survey was entrepreneur, with a large proportion also citing the not-for-profit sector as their top pick.

Tech companies, particularly startups, have recognised that for prospective members of their workforce, the opportunity to feel like more than a small cog in a large machine is a massive incentive. Though most of the large banks have jostled to keep up in this respect – launching incubator programmes for employees to pursue their own projects, rolling out mentorship schemes and championing projects that drive a social cause – they're in many cases still battling a reputational challenge.

Big banks are not traditionally associated with entrepreneurship and philanthropy. They're widely perceived as profit-focused meritocracies in which it can take well over a decade to reach a management position that has a real impact on the broader organisation.

Ms Hannaford says that attracting the best talent has and will always be competitive. "In this respect nothing has changed," she says, although adding that the competition for attracting the best talent in the technology sector has been amplified in recent years, "primarily due to the demand for engineering talent everywhere having increased exponentially".

"This is exactly why, as well as focusing on strategic recruiting initiatives, we also partner with organisations that work to encourage more people into technology careers," she says.


Fizkes on shutterstock


Lendable

Shoreditch office of fintech startup Lendable

Retention

At the higher end of the seniority spectrum, the challenge big banks face from tech is just as real. Financial institutions, which for years had relied on prestige, brand name and pay to retain top talent, are dealing with an increasingly discerning generation of workers.

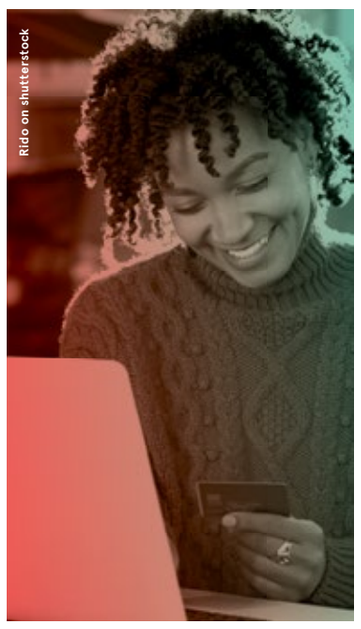
Beyond compensation, regular pension contributions and job security, employees increasingly expect to work for an organisation that puts their values at the centre of organisational strategies and aligns with their own culture. Individuals want to work at a company that understands the importance of diversity, whether in terms of gender, ethnicity or something else.

Again, many established banks have put measures in place to de-emphasise a culture of presenteeism, but reputation and image often take longer to change than true organisational structures. Startups and tech companies often have an edge only because they don't have a stereotype to overcome.

Martin Kissinger, founder and chief executive of Lendable, a UK peer-to-peer lending platform, says fintech startups "are only as good as the people they hire" and "culture is critical to bringing the best and brightest into the business".

"Companies like Lendable carefully cultivate an atmosphere of collaboration and execution, while having fun and offering a modern office and work environment, in our case, a large loft in [London's] Shoreditch," Mr Kissinger explains.

"Hierarchies are flat, there is no face-time, output is all that matters, serendipitous co-operation within the company is encouraged," he says. "This allows us to make our customers' and employees' lives easier, and stay agile as a company."


Rido on shutterstock

Regulation

Under open banking regulation, mandated by the UK's Competition and Markets Authority and introduced in January last year, banks must disclose performance and fee data, making it much easier for customers to compare products and providers. The rules also force financial institutions to use open application programming interfaces, or APIs, which enable customers to share their information easily with other providers.

Shortly after the new laws came into effect, Stanford Swinton and Eduardo Roma, two partners at Bain & Company in London, wrote in a report that the move would make it much easier for customers of big banks to transfer their accounts, manage payments and conduct transactions through other competitors, including non-banks, such as tech companies.

"Big banks face the prospect that many of their customers may seek out the convenience of digital aggregators, taking their accounts, and the profit pools they represent, with them," the partners wrote.

Bain & Company predicted that as much as 10 to 20 per cent of banking profits could be at risk of disruption as a result of open banking and within half a decade up to £2 billion of annual pre-tax profits could be vulnerable to disintermediation. It also found that 63 per cent of big bank customers in the UK would be willing to share financial information concerning their accounts with a competing bank, fintech or aggregator, such as a technology company, if it meant they could secure a better offer.

Customers below the age of 55 with an annual household income of at least £55,000 are most receptive to competitors' appeals, according to Bain & Company. And a majority have already adopted at least one fintech solution as an alternative to a traditional banking model, such as Apple Pay.

Tim Evans on Unsplash

DATA ANALYTICS

Data management has a long way to go

While banks have always stored and had access to a tremendous amount of client and transactional information, they are still not leveraging data to the fullest to better serve customers

Clare Gascoigne

Your bank has the deepest and most personal dataset about you that any institution has," says Ed Maslaveckas, chief executive of Bud, a UK fintech that connects apps and banks. "You might think Facebook or Google are scarily accurate, but the datapoints they have are a fraction of what your bank has."

The quantity of data banks hold on individuals is so huge it needs "warehouses" or "lakes" to store or make sense of it. Yet despite this, bank customers rarely receive the kind of tailored offering that comes from other companies; data management in banking has a long way to go.

"Other industries are thinking far more holistically about their customers and their data," says Falk Rieker, global head of IBU (international banking unit) banking at software multinational SAP. "Banks have optimised their data for functions such as know your customer or marketing, but they don't look enterprise-wide. There's no one to tie this data together."

For most chief data officers within the banking industry, simply consolidating existing data is enough of a task to keep them busy. But, according to a recent white paper, *Why data culture matters*, from consultants McKinsey, the number-one takeaway when looking to improve is that your "data culture is decision culture... The fundamental objective in collecting, analysing and deploying data is to make better decisions".

There are those who would argue a regulated industry such as banking has other commitments, with compliance playing a large part in banking data management. But Rob Casper, chief data officer at J.P. Morgan Chase, says: "If you simply rely on having huge quantities of data in a data lake, you're kidding yourself. Volume is not a viable data strategy. The most important objective is to find those business problems and then dedicate your data management efforts towards them."

Sadly for banks' customers, the industry has had little need to make those efforts so far. Hans Tesselaar, executive director at BIAN, a not-for-profit association that was established to promote banking interoperability, points out that historically there was little or no competitive pressure on banks.

But with the advent of open banking, which requires the biggest UK banks to provide data access to other, licensed companies, banks will need to try harder to keep customers satisfied. "The whole idea [of open banking] was to increase competition and competition will be the trigger to accelerate data management. The banks are sitting on a goldmine of data, but are not monetising it," says Mr Tesselaar.

> **Your bank has the deepest and most personal dataset about you that any institution has**

So, what are banks able to do with their existing data? Reach out, says Mr Rieker, with offers of help or introductions to partner organisations, but only after understanding their customers' actions better. "There's a lot of talk about the 'experience economy'," he points out. "Banks need experience data. They need to understand not just what the customer has done, but why. They need to use experience data to find out what is really relevant to their customers."

Consumers look to financial institutions for a variety of reasons, but key is help and advice for the problems faced right here and now. "What banks should be doing is helping and advising us in a unique way, that's the challenge banks are working towards," says Mr Maslaveckas. "It's not about flogging us stuff, but optimising your life and your finances. The truth about money is that what I want is not to think or worry about it and that's a complex issue."

But for all the talk of personalised banking, there's still a nervousness that it could also go spectacularly wrong. There are sensitivities around banking compared with other industries, where the more you can tailor your products to the customer, the easier it should be to close the sale. But, says Mr Tesselaar, finding out enough about your customer to make that uniquely personalised financial offer needs careful handling.

"You have to safeguard the trust," he says. "People don't care if Facebook makes them an offer; it's part of the game. Or if some information is shared; the idea of Facebook is sharing, so you're not that upset if it is shared further. But if my bank does it? That's more sensitive and more subjective. I might not mind if everyone knows I'm sitting in a pub, but I might mind if they know I've just taken out a bank loan."

Given the unique sensitivities around money, the industry needs to be particularly careful not to betray trust when it comes to data management in banking. Customers are unlikely to forgive the industry on this issue if it goes wrong. According to McKinsey: "An effective data culture puts risk at its core: a yin and yang of your value proposition."

So any analytics needs to be scrutinised to ensure there are no ethical issues and no compromise with regulatory requirements.

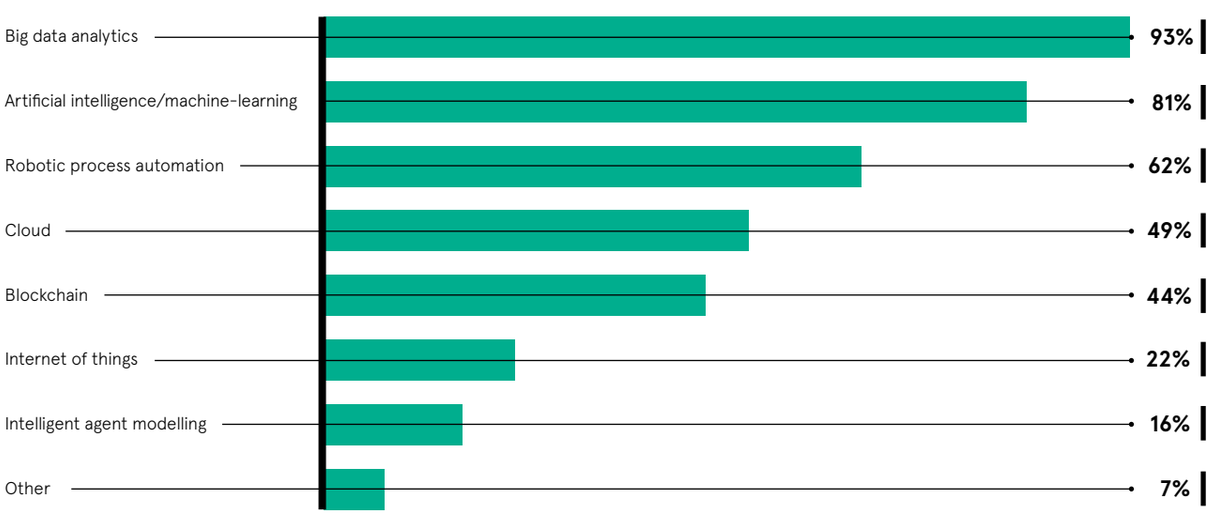
The banking industry has the difficult job of finding out what its customers want before the customers actually know themselves. After all, for most of us there's little attraction in comparing insurance quotes, unlike comparing white sandy beaches or the perfect trainers.

Banking is not generally an industry that runs on creating fashionable buzz around products or where cachet and status come into most people's choices. We just want not to be bothered by the faceless suits.

Data management in banking has been so focused on regulatory compliance and security that converting customer data into customer experience has taken a back seat. But as margins shrink and new contenders enter the market, the pressure is on to squeeze greater value out of those untapped reserves.

HOW FINANCIAL SERVICES FIRMS GOVERN AND MONETISE DATA

Percentage of investment banking professionals who believe the following will be transformative



AFME 2018

Account takeovers

How do they happen?

Data breaches (i.e Facebook) → Data sold to dark web → Data sold to hackers → Information used for account takeovers

5 ways businesses can protect their users

01 **Vet new accounts:** using a government issued ID with a corroborating selfie.

02 **Educate:** users about the dangers of recycling passwords

03 **Protect:** use 3D biometric face-authentication instead of username and passwords

04 **Adaptive approach:** use real time risk analysis to provide the precise level of security at the right times

05 **Pay attention:** for anomalies related to account takeovers

91% of people know that password recycling poses huge security risks

Experian 2019 Global Identity and Fraud Report

...yet **59%** still use the same password everywhere

Experian 2019 Global Identity and Fraud Report

...only **1%** of people know and care that passwords have patterns and those patterns can be tracked

Preempt, March 2017

Smart selfies help banks beef up security

Normal account login methods are no longer safe enough, faced with sophisticated and large-scale hacking, so the smartest banks are looking to advanced facial authentication to provide proper protection

Banks are facing a stern challenge to their security credentials as account takeover fraud becomes commonplace. The time has come to move beyond security systems based on usernames and passwords towards more high-tech solutions such as face-based authentication and biometrics.

Account takeover fraud takes myriad forms, but the results are typically financial losses for the individuals and a loss of confidence in their bank. Of course, it is not always easy for banks to spot when an account has been taken over because the nature of the fraud is such that the criminal is pretending, convincingly, to be someone they are not.

For banks, this creates a serious problem because their security systems have effectively been bypassed and from there a great deal of damage can be done. Indeed, US businesses were estimated to have lost more than $5 billion as a result of account takeovers during 2017, up three times in one year, according to Javelin Research.

Passwords and codes are no longer enough

The underlying problem is that hackers can use stolen information, often bought on the dark web, to access the bank accounts of specific individuals and then send funds to any number of different accounts as they wish. However, the issue is often compounded by the habits of consumers, who often use the same passwords on multiple sites, which then makes it easy for hackers to login to all those different accounts. Frictionless payment systems can also be part of the problem, given their objective of not excessively slowing or halting transactions.

Currently, account takeover fraud only looks set to grow and cause increasing problems for banks. Indeed, barely a week goes by without reports emerging of a high-profile international company having had its systems hacked and its users' personal information stolen. In the past year alone, there have been incidents involving the theft of hundreds of millions of usernames and passwords at the social media giants Facebook and Instagram, online video game Fortnite, data collection company Exactis and hotel operator Marriott, to name just a few.

"What's important for banks to realise is that just because their own systems might not have suffered a security breach and data theft incident, it doesn't mean they won't be impacted, as cybercriminals may have the login data at their fingertips," says Dean Nicolls, vice president of marketing at identity verification firm Jumio.

"For banks, the big question that follows is how can they better protect their customers and deliver better user experiences? That's where our technologies come in."

The answer by many banks is two-factor authentication, in which a one-time code is sent to the genuine account holder's phone when they log in with their password: a final access control. But these systems also have their vulnerabilities and among these are man-in-the-middle attacks in which people are tricked into divulging their codes by a pretend bank employee on the phone. For hackers accessing stolen data on the dark web, the established forms of authentication are increasingly easy to overcome as their techniques and technologies become more sophisticated.

> **Jumio's face-mapping biometric technology really comes into its own when there is a need for someone to prove their identity to their bank**

Selfie-based security adds real protection

As more data breaches hit the headlines every week, interest among banks is growing in physical biometric solutions, which are generally much more difficult for any fraudsters to get beyond. Face-based biometrics, such as that provided by Jumio, are a particularly vibrant aspect of this still nascent market, with consumers responding well to the convenience of snapping a selfie as evidence of identity. The process of taking your own picture is of course very familiar to a great many of us and Experian research shows 74 per cent of consumers already think physical biometrics will protect their information more than passwords.

According to Mr Nicolls, there is already strong interest among digitally sophisticated banks in face-based biometric solutions and the use of selfies as a form of online identity authentication.

The process relies initially on capturing a 3D face map, during the selfie-taking process, along with a government-issued form of identification, when opening a new bank account. In and of itself, the process overcomes many of the obstacles that banks traditionally face as they aim to establish someone's identity to open a new account in their name. The process does not, notably, require a bank customer to visit a physical branch location or to present a plethora of supporting documentation. All of which makes for a substantially streamlined process.

Jumio's face-mapping biometric technology really comes into its own when there is a need for someone to prove their identity to their bank. This could be required for any number of reasons, but perhaps most importantly for unusual or large-scale transactions. In this situation, a bank can request authentication and within a matter of seconds a consumer can demonstrate conclusively whether or not they are the person in control of the account, and they can approve or reject any transaction almost as quickly.

In these cases, the customer only needs to take a new selfie, from which a fresh 3D face map is generated, and is then compared to the original captured at account enrolment for an immediate authentication decision. It is not only an effective block to cybercriminals, but also a strong deterrent in the first place as they will not want their faces captured.

Providing the security consumers want

Asked whether consumers might have concerns about having a 3D mapped image of their faces, Mr Nicolls points out that financial service providers already retain access to plenty of information on their customers. "Ten years ago, you would have had to prove who you were in-branch, so you would've had to take all your documents to the branch," he says. "Face-mapping is really just a contemporary version of that process, except it's much more secure and you can do it incredibly easily via your mobile phone."

In the end, what consumers want in banking is the best chance of keeping their accounts safe and well protected. On that basis, solutions enabling the use of a selfie as a form of authentication look set to be popular among consumers, as well as among service providers that need to get better at protecting their customers to remain competitive, but also to avoid potential reputational damage.

To find out more about 3D selfie-based authentication please visit jumio.com

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