tribe

Fintech Five by Five

Five technologies and their impact over the next five years

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Contents

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Introduction

Last year, Tribe Payments asked what fintech was going to look like in a decade, inviting fellow fintech leaders and experts to contribute their thoughts. The project was a great success, offering fantastic insight into how businesses should be preparing for the future. Should we, for example, be preparing for fintech to be a nearly meaningless term? What happens when every business becomes a fintech?

That's the future, but what about now? What about the road that's just ahead rather than what lies on the horizon?

We wanted to change focus slightly. We wanted to find out more about the changes that are happening right now—the changes that don't need to be baked into future plans but need to be on today's to do list.

The best time to plant a tree was 20 years ago, and the second best time is now, according to an ancient Chinese proverb. This wisdom underscores the importance of acting now, if you haven't already. So, even if a business should have ideally boarded a technology hype train some time ago, there are still benefits from climbing aboard now.

Tribe has brought together five leading proponents of some of the most exciting technologies that are transforming technology right now: Blockchain, artificial intelligence, edge computing, low-code, and APIs. Each of these is in the process of shaking up fintech, those who are not integrating them run the risk of being left behind. But, of course, it's foolhardy to implement technologies simply because they are in fashion—it's vital to understand their potential and where they fit in fintech. Their contributions here are vital insight to anyone who wants to know how fintech is changing now.

We also surveyed over 80 executives in the European fintech sector, to gather insights into these technologies—which are the most important right now? How will they shape the market?

Fintech Five by Five is an invaluable look at five technologies over the next five years, whether you have planted all of your trees, or still plan to plant a few more.

Alex Reddish, Chief Commercial Officer, Tribe Payments

Summary:
A tale of five technologies

Artificial Intelligence, APIs, blockchain, low-code and edge computing are all very different technologies. We chose them for what they have in common—each looks set to change fintech in fundamental ways, either right now or in the very near future. But none of them are rival technologies. Each has its own place and can coexist.

What is striking about the contributions from Microsoft, R3, Fintech OS, Canonical and Truelayer is they have one key thing in common: They are all practical, down-to-earth, and have actionable advice. There is no sense that these technologies will struggle to meet the needs of the fintech sector, or will be all hype and no trousers. These are all technologies with something to offer the financial services sector today and in the future.

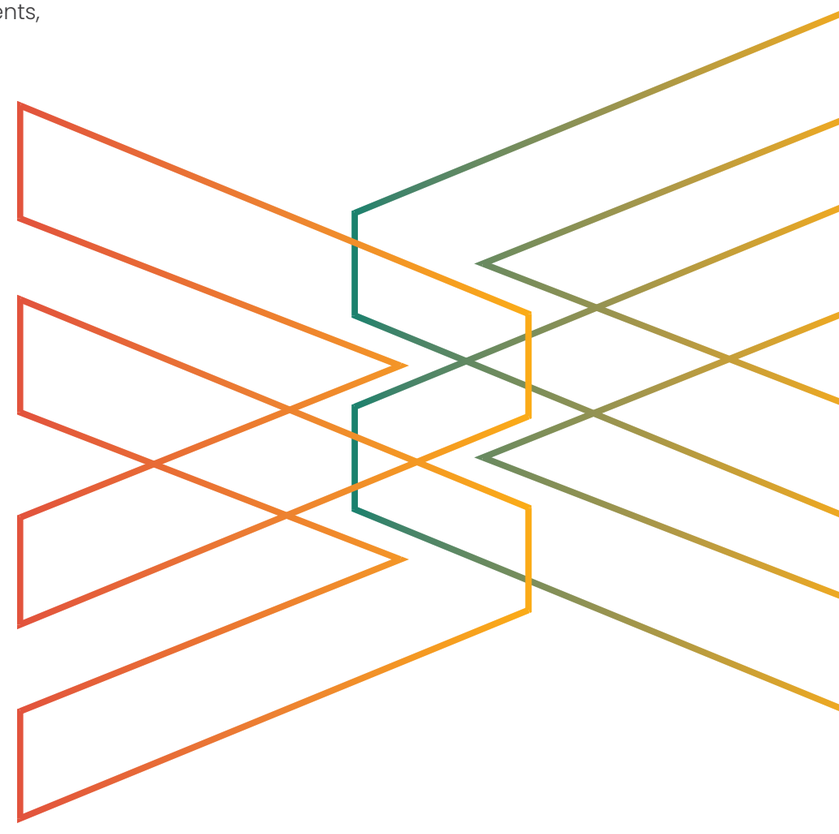
In this report:

- **Daragh Morrissey, Microsoft,** sees fintech as having the potential to lead and keep leading when it comes to AI. Regulation, skills and legacy technology could slow the industry down, but if these issues are dealt with, there's no reason why AI can't help keep the sector at its innovative best.
- **Marie Steinthaler, TrueLayer** discusses how APIs are underpinning fintech today, but that's no reason to stand still. APIs are shifting from passive providers of account information to active payment initiation—but both of these will lead to innovation and new use cases. Open Banking scepticism is slipping away and the idea is going international.
- **Richard G Brown, R3,** shows us how blockchain is far more than the technology that underpins cryptocurrency, but can enable new ways of guaranteeing confidentiality and privacy—something in high demand and short supply today.
- **Kris Sharma, Canonical,** explains how Edge Computing and "microclouds" are an innovation that will pick up where cloud left off, a way to evolve their cloud provision by identifying where exactly the cloud isn't quite meeting their specific needs. With specialist fintech requiring low latency, fast analysis, and superior resilience, microclouds could hold the answer.
- **Teodor Blidăruș, FintechOS,** tackles the developer skills gap using low-code—but there's more to the technology than that. Low-code means that more people can be part of development, bringing their insight and experience.

But, just as these technologies have this common thread, they are each unique when it comes to where they are in the "hype cycle" and how much the fintech market understands their potential impact. APIs are already here, AI is very much on the way, and blockchain is understood though not as widely implemented yet. Edge Computing and Low-Code, whose benefits and effects are understood, are lagging a little when it comes to implementation and expectations. These are the technologies that fintechs should be looking more closely at—have they missed a trick? Are they so blinded by the possibilities of AI that they have difficulty seeing the potential in other technologies?

Our research shows that, while some areas will be more affected than others by these technologies, none will be left untouched, whether it's retail banking, payments, insurtech or regtech.

We don't need to look a decade ahead to find revolutionary change in fintech. It's happening today and will keep happening. It's that ongoing change that is, in fact, the best sign that fintech is still delivering on its promise.



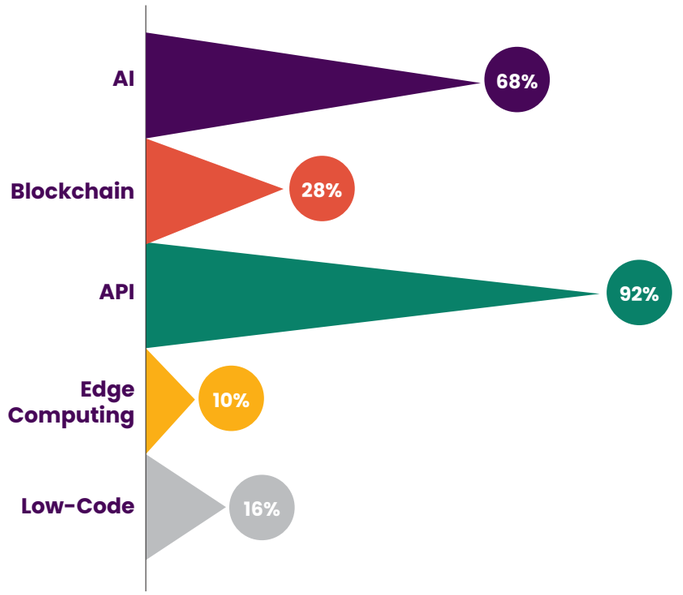
Survey analysis:
The impact of five selected technologies on financial services

How 5 technologies will impact fintech

Technology cycles now move so fast that it's a challenge to evaluate every trend: Is it relevant? Is it useful? Is it applicable to every part of financial services? Technologies can move from cool futurism to current application with a speed that means "we can think about that later" can be a costly attitude.

The aim of the survey was to determine what fintech professionals thought of the five different technologies that we saw as having the biggest potential impact over the next five years. We wanted to discover how tech innovations are going to affect our industry from the people implementing it.

Technologies already implemented



To get a good understanding of the current situation, we first asked which technologies fintechs had already implemented.

We were surprised to learn that AI was in use by almost 70% of respondents, despite it being generally regarded as a future technology forever "five years away". Blockchain, on the other hand, had only been implemented by around 20%, despite a history of recent hype. And while edge computing (10%) and low-code (16%) had only been deployed by a minority, APIs are being used by pretty much everyone.

We then asked respondents to rate the impact of five different technologies over the next year, and over the longer term, putting them in order. This was the average rating:

Most impact in the next year	Most impact over the longer term
1. APIs	1. AI
2. AI	2. Blockchain
3. Blockchain	3. APIs
4. Low-Code	4. Edge Computing
5. Edge Computing	5. Low-Code

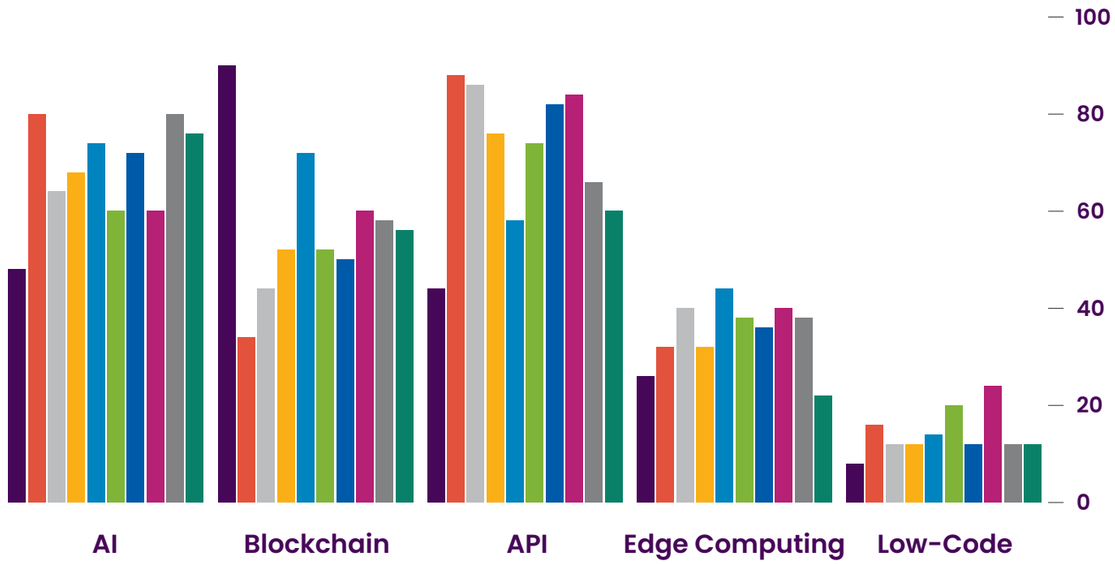
APIs are seen as having the most immediate impact. This is unsurprising as APIs are in use today, and their effect is increasingly obvious in Open Banking—and soon in Open Finance. But they remain important over the long term. Integration of services will continue.

Potentially more surprising is **AI**. According to our respondents, its time is here, and it's only going to be more important long term. As before, this perennial future tech is now seen as very much here in the present.

Potentially surprising is **blockchain** seen as having more impact over the long term. Many recent news stories on blockchain technologies have been negative, from the NFT bubble to crypto instability. But blockchain is increasingly seen as its own thing, and the negative press hasn't dampened enthusiasm for the underlying technology.

Low-code and edge computing are languishing at the bottom of the table. We believe that these technologies will have as much of an impact as the others, but just don't have the same "buzz" right now—they are underlying, technical solutions rather than breakout superstars. But those technologies that automate, reduce costs and boosts efficiencies will get their time in the sun.

Which sectors will be most affected?



Asking respondents where these technologies would have the most impact revealed a similar pattern, though some answers stood out:

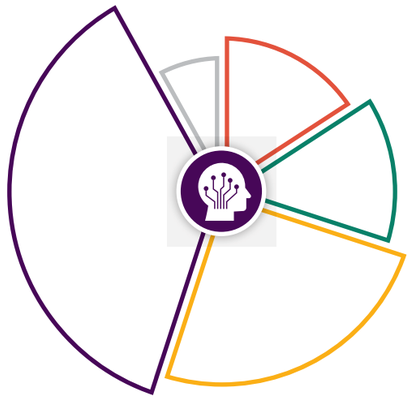
- **AI** was seen to have the biggest impact on Insurtech, Wealth Management, Trading, Lending and Retail Banking, where better and faster decisions would make a real difference.
- **Blockchain** will, unsurprisingly, make a big impact on Crypto, but Trading isn't far behind, suggesting that smart contracts have a big future.
- **APIs** are predictably big in many areas, but not seen as a big part of Crypto—will it remain a financial technology outsider or be better integrated in the future?
- **Edge Computing** is most popular in trading where speed is vital.
- **Low-Code** will have the biggest impact in payments, where there is an appetite for integration for embedding into other services.

- Crypto
- Retail Banking
- Business Banking
- Regtech
- Trading
- FX
- Lending
- Payments
- Insurtech
- Wealth Management

How will each technology affect fintech?

Key to understanding the impact of these technologies is not just if they will affect the market, but exactly how they would do so. For each technology, we asked how its impact would be felt.

Artificial Intelligence



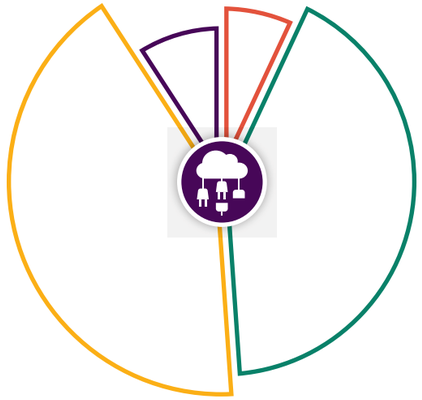
- Better credit scoring through smart algorithms
- Consumer-facing chatbots
- Financial recommendations for businesses and consumers based on transaction data
- Predictions of consumer behaviour
- Specialist applications, eg Insurtech

38% of respondents think AI will impact predictions of consumer behaviour

By far the biggest future application of AI will be predictions of consumer behaviour, followed by AI acting as a financial advisor.

Essentially, AI will see the patterns that humans cannot, making better decisions and providing better insights--whether that's fintechs looking to serve consumers to a higher standard, or consumers looking to make their investments work harder. We were surprised that chatbots were not higher up—it is possible they are too common now to be seen as a future application.

APIs

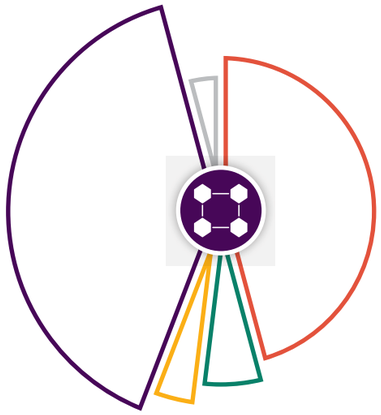


- Account information service providers
- Embedded finance
- Identity verification
- Replacing payment rails

Only 6% of fintech professionals surveyed thought APIs will impact account information service providers

Embedded finance is one of the big industry shifts that will take place over the next five years and APIs will be central to this change. And as IDs move away from physical documents to digital ones, APIs are key for scale and security.

Blockchain

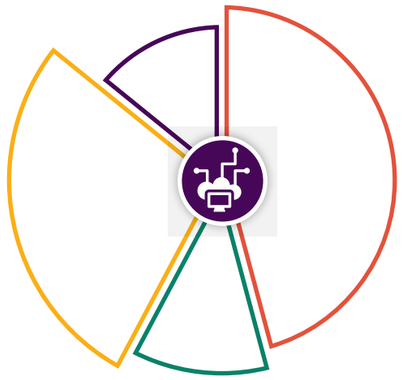


- CBDCs
- Cryptocurrency going mainstream
- ID verification
- Insurance
- Smart contracts

46% of fintech professionals think blockchain will impact cryptocurrency going mainstream

The surprise with blockchain is not that 'cryptocurrency going mainstream' was a popular option, but smart contracts being almost as popular. Fintech clearly understands this application of blockchain just as much as crypto. Meanwhile other applications seem to have little traction.

Edge Computing

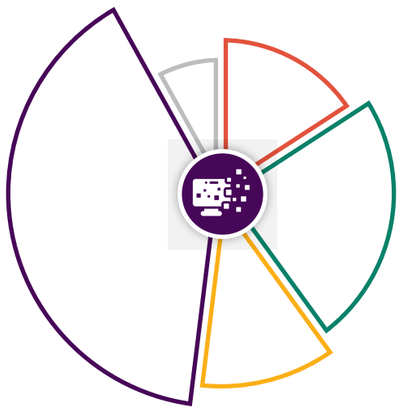


- Better data analysis and decision making
- Better personalisation of services
- Remote banking
- Underpinning AI

46% of survey respondents though edge computing will impact better data analysis and decision making

Edge computing is seen as technology underpinning better data analysis and remote banking, but we think this is a technology that is far less understood than the others. Edge computing right now simply doesn't get the same headlines as AI and blockchain—people understand that it can make things faster, but we think there's little understanding beyond this surface.

Low-Code



- Allowing developers to focus on where they are needed
- Allowing non-developers to create applications
- Easier integration between products
- Faster innovation
- Saving on developer costs

Just 8% of respondents believe low-code will bring savings on developer costs

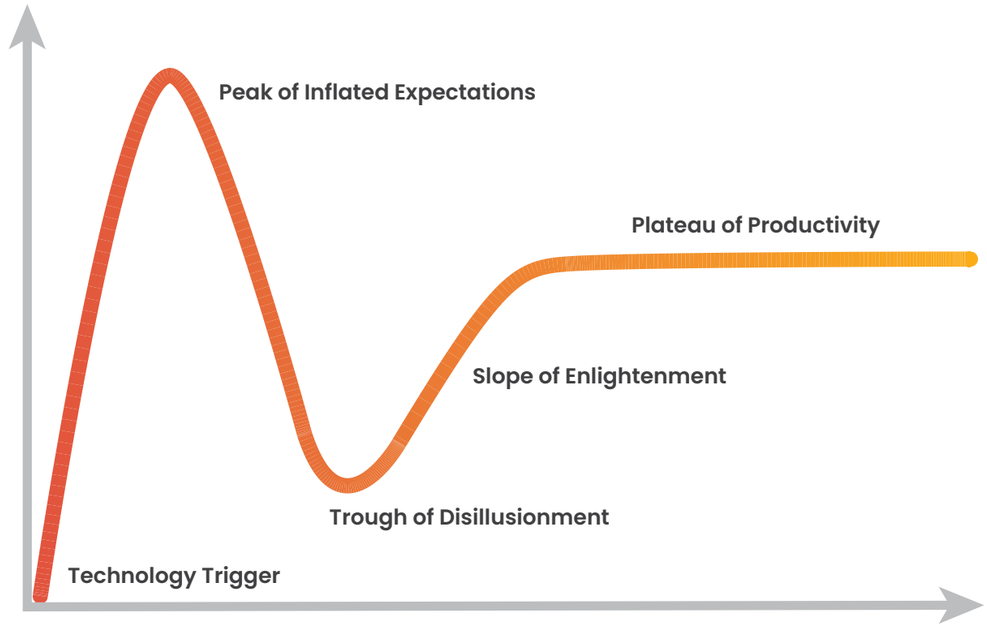
The biggest impact of low-code is seen to be faster innovation, whereas the reallocation of developers, seen by low-code enthusiasts as one of the biggest advantages, was not seen as the main impact. 40%+ think it's going to impact innovation. This is perhaps a measure of priorities—speed could be more important right now than any other impact.

Key takeaways: Five technologies, five different paths

The Gartner Hype Cycle has been an incredibly influential way to talk about new technologies, describing their path from hype to overhype to eventual acceptance. Each technology can be placed somewhere along this timeline, though not all go through this process at the same speed.

Perhaps the Hype Cycle is less useful here. Even though it's possible to place each of these technologies somewhere on the path, what's more striking is how different each one is on its path to acceptance. Each is unique.

The Gartner Hype Cycle



According to our respondents, our chosen technologies will have the biggest impact in this order:

1. AI has been overhyped for years, a dream going back through science fiction to the folkloric golem. This means it is still seen by many as a "future technology", forever several years away, as the reality doesn't yet meet the fictional representations. But fintechs are implementing AI today, and the reputation as all hype and no substance is no longer deserved.
2. Blockchain's future lies not just in cryptocurrency, but in smart contracts. Even if the crypto dream isn't realised, blockchain won't be going anywhere.
3. APIs are here and pretty much a mainstream technology, but regulation has played a big part in this. It's not so long ago that "screen scraping" was seen as a viable alternative, before standards were mandated.
4. Edge computing is still to gain the buzz that it should, perhaps as it's a little bit "inside baseball"—the implications are mainly understood by those closest to the technology. It may gain wide acceptance without ever being overhyped—and is simply a better way of doing some things.
5. Finally, we see low-code as the dark horse of these technologies. To use it, there will have to be an attitude shift in many fintechs that makes development something that is done by more than just developers. Fintechs that make that realisation will likely inspire others to follow their lead.

Calling fintech a "revolution" was maybe a mistake. Sure, the old ways of doing things are dying and new ways of working are now normal. But it's also an ongoing, rather than overnight, change that will embrace many different technologies over time.

Brands that do not try to keep up with this change have ultimately learned nothing. This research highlights that while there's excitement and interest in the newest technologies, there's still a need to go beyond the most hyped.

Insights from 5 technology leaders

What's next for AI in fintech:
From experimentation to execution

Daragh Morrissey, Director of AI, Microsoft Worldwide Financial Services

Microsoft

AI is no longer future technology. It may still occupy the imaginations of sci-fi authors and screenwriters but for many businesses it's a reality. It is, in fact, a reality for many consumers too, with AI hidden in everyday applications in ways they don't expect.

There are, of course, high-profile use cases, such as ever-more sophisticated virtual assistants, but these hide more everyday but no less effective applications. One of the most effective uses of AI is to find efficiencies in complex networks, such as supply chains and mobile networks. It can make fast decisions based on a lot of information. There are fields such as medicine where AI is quickly becoming indispensable.

Where are fintechs in all this? This is a tricky question given that fintech is a fuzzy term these days, ranging from scrappy startups a few years old to fintech unicorns and global banks. Zest Finance, for example, has a cutting-edge approach to AI. By defining fintechs as predominantly innovative new banks and high-growth start-ups, it's clear they are making good use of AI but there is certainly more that could be done.

That's not to say there aren't challenges ahead. Fintechs are known for their boldness, but regulation is rightly causing pause for thought. As such there is a tendency for fintech's to use AI to solve simpler problems rather than complex issues, closer to automation than realizing the full potential of artificial intelligence.

Financial service providers should be asking where they could be applying AI now, and moving past the stage of pure experimentation. AI has a wealth of applications in financial services, so it may be probably faster to outline the areas where it won't help than all the places where it will be embedded.

Shifting from experimentation to execution in the short to medium term is critical.

The view from Microsoft Azure: AI is all about the right people, and you may already employ them

The financial sector is running a real risk of falling behind when it comes to AI. Progress across the sector has been uneven, and while fintechs are generally doing well, there is a risk that the pace of development will slow.

These are the biggest potential roadblocks for AI in fintech:

- Financial services providers must always have an eye on regulation—not just on current regulation, but what is on the way and what is planned. Many traditional systems for extending credit have been rules based. Moving more decision making to AI based systems drives a requirement for these new systems to be transparent.
- This reluctance is to be expected and should not be dismissed. Regulation needs to be factored into all discussions and any implementations.
- Many fintech disruptors have been gaining traction by doing what bigger providers already do, but doing it better. Innovation has mostly been in creating a better user experience and not taking on a great deal of risk. While some fintechs have fully embraced AI from the get go, others have not, and doing so will require change. It won't be like turning a tanker around, as with a big bank, but change is never simple.
- The bigger providers are still dealing with legacy technology. This doesn't prevent them from engaging with AI, as it's still more than possible to build a data capability in the cloud, and either break down data siloes or aggregate on-premise data in the cloud. But there may be some hesitation to invest in what may be seen as further complication while legacy issues exist.

Fintechs may be at an advantage when it comes to AI, but this may be short lived. AI is likely to be adopted across the industry to solve many different problems, and those who make the most of the technology will be in a far better position than those who don't. Addressing these potential speed bumps will be key.

People are the solution to the people problem

One of the biggest obstacles any business, not just financial services, will face when working with AI is the need for people who can make it work. AI is about as far from a "plug and play" technology as it is possible to get. Experts are needed at every step of the process of implementation—whether that's defining the desired outcomes, training the AI, and tweaking algorithms to ensure the desired outcomes are being met.

There is fierce competition to hire and retain the right people. Building a team that can make a success of AI has the potential to be extremely difficult and expensive.

To close the skills gap, Microsoft is offering new AI capabilities that make it much easier and faster to build AI applications for people without a data science background.

Does that mean fintechs that lack the deep pockets of bigger businesses may are at a disadvantage? Not necessarily. A culture of innovation may be more attractive than a bigger salary. People want to think that they are making a difference, and joining an agile fintech may hold more appeal than working for an incumbent.

One solution to the people problem is to make the best use of the staff you already have. Microsoft is working hard to make the appropriate training available so that any business can make the most of AI. Training can democratize access to AI, and make sure it's not just those who can throw money at the problem who will thrive. Your AI team may already be in your company, you just need to find it.

The need to build in ethics

There was a promise once that computers would remove human biases and make perfect decisions. But it's clear now that AI can not only reflect human biases, but can amplify them. Any business that implements AI needs to recognize this issue and address it from the start. It's far more difficult to address this issue in retrospect.

The fast decisions made possible by AI have many potential applications in financial services. Two of the biggest are credit decisions and detecting financial crime.

'Your AI team may already be in your company, you just need to find it.'

Providers can let their biases get in the way of assessing risk, letting caution get in the way of potential revenue. AI is far better at assessing risk than blunt tools such as credit scores, which means providers can serve customers where they would previously be limited. Part of that better modelling of risk is eliminating biases that would leave certain groups at greater risk of financial exclusion.

AI also has the potential to save millions by attacking financial crime. The rules around AML and KYC go so far, but all it takes is someone savvy to what the rules are to find a way around them. Similarly, rules that protect against fraud are just that—rules. Rules can be broken and subverted whereas people can see shady business going on. But there simply aren't enough people to find every suspect transaction.

AI can help every financial services provider to avoid fines, protect businesses from fraud, and drive inclusivity. The potential is immense, but it's key to build in ethics as soon as possible to avoid problems.

Fintechs have the potential to keep leading on AI

Some incumbents have admitted to being scared by the potential of fintechs. And they should be. Smaller companies have the advantage when it comes building sophisticated AI. Without legacy technology to deal with, fintechs simply don't have to revolutionise how they work to start implementing AI.

Some incumbents are working hard to narrow the gap, and some are already there. Fintechs may need to start thinking outside of their niche. Their immediate success has often been on doing one thing very well—how could AI apply to what they do? Should they be looking to partner with other fintechs on AI partnerships? If they lack the in-house skills, how do they solve this issue? By throwing money at it, or by building the capability in-house?

Whatever the question, fintechs should find answers quickly. Their advantage won't last forever.

Daragh Morrissey is a Director at Microsoft Worldwide Financial Services. His passion is enabling Microsoft customers to innovate through adoption of technology and culture transformation. He's presented at Industry events such as SIBOS, Americas FinTech Conference, Money 20/20, and global Microsoft events (Inspire, Ready, and Envision). He is a Certified IT Architect Professional with the International Association of Software Architects (IASA).

Key takeaways

- AI requires new skills. You need to hire, upskill, or partner with someone who has the right skills. This is potentially an excellent opportunity to build in-house skills, and create loyalty.
- Biases and ethics cannot be afterthoughts—working to create ethical, inclusive AI now is vital to creating businesses that are even better than the people who build them.
- Legacy technology is a real barrier preventing big incumbent providers from making big strides in AI. Smaller fintechs may struggle with scale, but there will be increasing opportunities to partner. Incumbent providers, partnering with fintechs and making good use of AI will make for a formidable force.

APIs are not just helping fintech—they are fintech

Marie Steinthaler,
VP of Data Products,
TrueLayer

There are some technologies that make change better, and there are technologies that are necessary to change. APIs are the latter. To say that APIs are underpinning fintech is to understate their importance. APIs have been as important as the cloud and mobile technology in creating the fintech market we have today, and without APIs the march of fintech simply will not progress.

APIs create a common language that connects providers with each other and—crucially—with businesses that are not financial services. These connections will define the next decade of fintech, embedding payments into apps and brands. These partnerships are new ground both for these brands, and APIs will underpin and enable these.

Embedding collaboration will become the norm

Any lingering skepticism around APIs is now either dead or dying. There may have been resistance to Open Banking regulation and multiple delays, but the concept is no longer new. Consumers now understand and appreciate some of the benefits even if they don't necessarily (and arguably shouldn't) need to know that these changes have been enabled by open banking. They are starting to expect their banking apps to show balances held elsewhere and provide new services all from within that app. Banks that don't embrace this will quickly be seen as relics, as these expectations are only going to grow.

This puts us firmly in the era of open banking. There is still much to be done but those with an eye on the future will be thinking about the upcoming era of "open finance" which will extend open banking principles across the majority of financial services, not just banking. Other parts of the world are keen to catch up and implement APIs widely, with the US in particular proactively building infrastructure to support APIs. It's clear APIs will shape the fintech market over the next decade.

But what about the immediate future? What do fintechs need to do right now?

What can we expect in 2021?

The first and most obvious use of Open Banking APIs has been to provide a single view of finances by aggregating multiple balances and account data in other banking apps. Consumers are quickly getting used to the idea that their credit card balances and savings accounts can appear in their banking app of choice. This is a start of a shift in both what is possible and expectations over what is possible. Given time, consumers will no longer see it as a neat added extra but will complain when it's not available.

This sharing of information will extend beyond just financial services companies accessing the data, to companies in many industries making use of banking data to deliver better services and products. What if, for example, you could see what was in a particular bank "pot" before making a purchase at your favourite marketplace? What if your fitness app released funds as a reward for exercise? Both fintechs and those outside fintech will bring fresh ideas—and in 2021 we are starting to see more innovative use cases emerge.

2021 has seen the acceleration of bank-to-bank payments via open banking, for example, enabling customers to instantly fund their trading and investment accounts. We see some clients where 70%+ of users are now choosing open banking as their primary payment method. The use of embedded API-initiated payments as part of everyone's daily lives are likely to be a few years away yet, but there won't be as big a gap between fintechs adopting this technology, and widespread use by non-fintechs as some have assumed. Indeed merchants are likely to be the ones who lead it into the mainstream.

The shift from using APIs to passively receive information, to actively driving transactions or engagement between parties, is a big one. Each successful use case will mean the market will have confidence to move further—from balance information, to initiating payments, to customers opening entirely new products without ever leaving the app they are using, all made possible with APIs.

'Usage and value metrics will come to the fore providing a far better understanding of how APIs are being used and their impact.'

In 2021 we have seen regulators in more markets outside of Europe pushing forward legislation that requires banks to provide APIs. But there will be a shift in attitude here too.

While there was resistance to the adoption of Open Banking and PSD2, forward-looking banks will be creating APIs without regulators demanding that they do so. Banks don't want to leave fintechs to be the only agents of change, and taking action on APIs is one good way of driving transformation.

APIs will also become more sophisticated, enabling more financial products, such as mortgages and loans, paving the road to a future that is dominated by embedded finance.

In 2021 we have seen an end to the "vanity metrics" that have been a big part of the discourse around APIs, which showed how much availability there was of APIs rather than their use. Usage and value metrics will come to the fore providing a far better understanding of how APIs are being used and their impact.

Is an API right for your business?

It's important to think about this the right way round—use case first, then the technology being used to support it. Do not fall into the "blockchain trap" of looking for where a solution can find a problem. It's okay—and we encourage it!—to get excited about the possibility of what APIs can offer. But when all you have is a hammer, everything can look like a nail. Once you fully understand your customers' needs, the use case, and the type of API that will make this work, it's often best to work with a partner to make things work. Open Banking APIs can be complex, making them prohibitively expensive to integrate with directly. Even though the promise of APIs is standardisation, and though they are standardised in some regions, there are different interpretations of that standard. We are quite some way from plug-and-play.

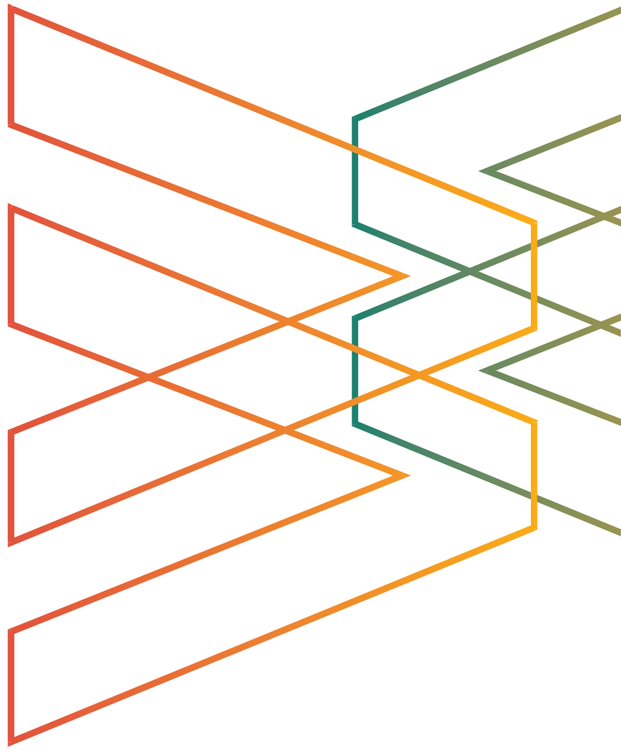
'Even though the promise of APIs is standardisation, and though they are standardised in some regions, there are different interpretations of that standard. '

The exception will be those businesses that are big enough to devote the resources necessary to create and maintain an API. Even then, they should think hard about whether this is core to their business and worth building intellectual property around. Like many other technologies with wide applications, it's important to decide whether it is worth redoing work that others have already done.

'2021 is seeing significant growth in the use of APIs, particularly when it comes to instant bank transfers, powered by open banking.'

Key takeaways

- Build an API strategy—APIs will have a role to play in your business. But it's important to interrogate exactly where they fit, and whether their role will be relatively minor and stay that way, or if they will be increasingly important to ongoing innovation and growth.
- Decide whether to go it alone or partner—if you're building a bespoke, rich API central to your business then it may make sense to get the expertise in house and build it yourself. Integration will mean a similar choice, and expertise is necessary to both. In most cases it makes sense to work with a partner. Why replicate work that has already been done?
- Get started now—APIs will define the next decade of fintech and no one wants to be left behind. They will be a part of your business, so it's better to start thinking about use cases and implementation now rather than put it off.



Marie Steinthaler is Vice President of Data Products at TrueLayer, Europe's leading Open Banking platform. Prior to joining TrueLayer, Marie was Head of New Products for Zopa, a UK challenger bank, where her teams developed new ways to help borrowers manage their money better. Before Zopa, she led growth at Hopster.tv, a leading app for preschoolers, launching the app in 100+ countries and growing the user base to hundreds of thousands.

Blockchain in 2021:
Steady progress beyond the hype

Richard G Brown, Chief Technology Officer, R3

Anyone who still sees blockchain as a solution in search of a problem is out of date—use cases abound. Central Bank Digital Currencies (CBDCs) continue to gain momentum.

Blockchain technology is used for post-shipment trade financing, to create issue and approve letters of credit, to underpin bank reconciliation. However, there remains a perceived slowness of blockchain deployment in real-world environments. In many areas, the technology is ready, and we are waiting for the 'soft' systems to catch up.

Blockchain is changing the way parts of these businesses function, and that requires new procedures, training for staff and the support of regulators. All this takes time but is happening at pace in countless different industries. It might not make for the best headlines, but slow and steady is the only way to deliver sustainable technology change. Unlike cryptocurrencies that are grabbing headlines through fast gains and crashes, blockchain in 2021 is an ongoing story of reliable, steady growth.

Reimagining security by sharing—without sharing

The lifecycle of technology is such that a product that at first seemed ground-breaking soon becomes commoditised and accepted as the status quo… and sometimes even made obsolete.

Think about something as mundane as security on the web. The once rare green padlock in the URL bar is now a ubiquitous visual cue to the user that the page is secure, and they can submit sensitive information without worry. We now simply expect it as the bare minimum of online security.

But how does this apply to data security in the world of fintech?

As we head into 2021, we're beginning this same process in the lifecycle of a previously niche technology, Confidential Computing. It was those working on enterprise blockchain projects who have helped propel it into the mainstream, but the impact will spread far beyond as it helps us deliver on the promise of securing a business's data while in use.

Aren't security protocols such as HTTPS already meant to protect us like that? Well, you might assume that, but no. Have you ever stopped to ask yourself what that little green security padlock actually means?

This padlock is present when you browse sites like Facebook, and yet aren't they appearing in the news regularly accused of "selling" or "misusing" your data?

The answer, of course, is that the padlock is there simply to ensure you really are logged in to facebook.com and not some other site. And it ensures that nobody can intercept your private information as it flows back and forth between your computer and Facebook's data centres.

This is important, of course, but notice how that padlock doesn't tell you anything about what Facebook will do with your data once it arrives.

'The way that data is used by social media sites has been a concern to consumers and regulators for a long time.'

The way that data is used by social media sites has been a concern to consumers and regulators for a long time. There have been recent consequences, with users abandoning WhatsApp—owned by Facebook—in favour of Signal and Telegram. Fintechs should take note. They might currently enjoy the trust of their customers, but that trust is fragile and needs to be protected.

This is where Confidential Computing comes in. This technology makes it possible to check what program is running on somebody else's computer before you send your information, and to be sure that the owner of that computer can neither influence nor observe what's happening. And it's going to utterly transform how we think about data security.

What does Confidential Computing have to do with blockchain?

What if firms need to gain collective intelligence from data that needs to remain concealed? Blockchain on its own has no answers to that question. But by integrating an adjacent technology – such as Confidential Computing – this challenge can be overcome.

The last five years of enterprise blockchain development have shown we can solve problems for entire markets in a way that we couldn't in the past. Just look at some of the market-wide initiatives that are already live – Spunta Banca DLT for interbank reconciliation in Italy, B3i for the global insurance industry, and Contour and Marco Polo for trade finance. But that's not to say it's easy bringing so many different players together – in fact, it's been much harder than many of us anticipated, and taken much longer. But it is possible – and the live use cases of this technology continue to grow.

Ever since blockchain firms began working with clients on tackling their challenges with blockchain technology, there would always be someone in the room that would say: "you don't need a blockchain for that!" And sometimes they were right. In some scenarios, firms needed to collaborate at a market level but not everyone's records needed to be synchronised.

The challenge was sometimes to bring together data to extract insight but without anybody seeing anybody else's information - and this is what Confidential Computing is able to achieve. The combination of these two innovations enables collaborative data processing without giving up privacy.

'Imagine if a bank or fintech actively gave up its freedom to see your data by deploying Confidential Computing. Isn't it possible it would actually grow its market share? Would they not quickly become a market leader? '

Imagine if a bank or fintech actively gave up its freedom to see your data by deploying Confidential Computing. Isn't it possible it would actually grow its market share? Would they not quickly become a market leader? Confidential Computing means that fintechs can gain insight from their data, and their partners' data, without even having direct access. People are increasingly wary of their data being used and examined, even though they happily sign up to this when they click through a pages-long agreement—why are the ads shown spookily perceptive? If fintechs can gain insight while keeping a safe distance from sensitive data, they will reassure both regulators and the public, gaining on the trust they have already built.

And that's why the convergence of blockchain and Confidential Computing is my tip for 2021's most meaningful development in financial technology. It will be the table stakes for anyone processing other people's data in a few years' time, but those who master it in 2021 will enjoy an amazing period of competitive advantage as the only ones in their industry who can make data security promises to their customers that their competitors could only dream of.

'Confidential Computing means that fintechs can gain insight from their data, and their partners' data, without even having direct access.'

Richard Gendal Brown is Chief Technology Officer at enterprise software firm, R3. Richard's team designed R3's flagship blockchain platform, Corda Enterprise, as well as its confidential computing platform, Conclave. Richard was formerly Executive Architect for Industry Innovation and Business Development for IBM's Banking and Financial Markets business in the UK.

Key takeaways

- We're well past the stage of finding use cases for blockchain—many use cases are live. Even so the use case must lead the decision to use the technology.
- Meeting regulations is one of the biggest challenges for banks and fintechs in 2021. Confidential computing will help meet this challenge.
- Privacy is increasingly a competitive advantage. Building systems now that protect privacy without compromising insight offers a big competitive advantage.

Moving to the cloud... and back?

Kris Sharma, Finance Sector Lead, Canonical

CANONICAL

The rise of fintech over the last decade could be attributed to a combination of many factors—dissatisfaction with the banking industry after the financial crash, a smart device in everyone's pocket, a culture of startups that led to fast growth of the ideas with the best potential. Cloud computing underpinned a great deal of this change.

Fintech quickly realised that innovation is far easier and less costly using the cloud, ideas could be quickly prototyped and then iterated upon or discarded without worrying about sunk costs.

But the cloud doesn't solve everything—in fact, the centralisation of processes through the use of cloud can, at times, result in additional challenges for Fintechs thanks to their business model—-and these need to be addressed by a complementary infrastructure solution .

A move back to on-premise is not on the cards, except in very specific circumstances. Instead, there needs to be a compromise, where the benefits of cloud and on-premise co-exist. Edge computing, aka "micro clouds", is not a move back to on-premise, but a cloud computing model that uses smaller facilities with a smaller cluster of servers.

What difference does this make? Edge computing is conceptually simple—data is captured, processed, and analysed near to where it is created, rather than sent all the way to a central cloud and then back again. This is important when speed is absolutely critical, for example trading that relies on milliseconds to be effective. Within the Fintech industry, there are multiple use cases of Edge technology implementation.

The fintech market is fast maturing and thus facing rising costs, increased regulatory scrutiny and cybersecurity challenges. Edge computing is vital to overcoming many of these.

Edge computing, or "Micro clouds"?

Edge computing is the industry accepted term for this technology, but it's still confusing to many. It fails to capture what the benefits to businesses might be. At Canonical, we think it's better to think in terms of "micro clouds".

A micro cloud is a small cluster of compute nodes with local storage and networking. There is a minimum of three nodes in a cluster so as to enable high availability and self-healing.

It offers redundancy and scalability, with setup and ongoing maintenance automated through APIs—vital when these nodes will be distributed at the edge of a network and not centralised.

Crucially, this is not a move back to on-premise. It's smaller, managed, decentralised clouds for computing at the edge. Micro cloud is not an alternate solution to the cloud, but a technology with specific use cases that will be far more suitable, if not necessary for success.

Better innovation is possible through collaboration

Cloud has enabled innovation and growth within the fintech sector and beyond. It will continue to do so, and most businesses are adopting a cloud-first strategy to enable this. But it is not a universal remedy. Not every part of a business will benefit from being moved to the cloud, and organisations need to review use cases for cloud migration.

There are four key challenges with cloud that fintechs have to deal as they become bigger and more mature organisations and micro clouds are much better suited to address them :

- Low latency and high speed. When speed is at a premium, cloud simply won't cut it, no matter how fast it is. Trading in particular relies on very low network latency to be effective, and no matter how fast a connection is, data travelling a long distance will result in high latency . This is just one example of a business application where micro clouds are extremely well suited. Data-heavy applications such as AI decision support systems could also benefit from processing closer to the data source to ensure it acts in real-time.
- Regulation, particularly across borders. Governments are increasingly twitchy about what personal data is held and what this means for those holding it—and different parts of the world have different regulations and different demands on those holding and making use of data. This is a potential nightmare for fintechs who as they mature, work across multiple markets and are increasingly global. Moving data around means dealing with GDPR, CCPA and other complex regulations. Moving and replicating data is inherently risky, and should only be done if necessary.
- Cost is a driver for cloud but also a barrier. Cloud isn't always cost effective and businesses need to closely monitor costs of cloud computing—particularly where services are using more capacity than expected or old abandoned projects that may still be billed for cloud compute. Edge computing can help fintechs keep these costs in check.
- Control from greater autonomy. Going from on-premise to cloud means giving up a great deal of control—the old canard about the cloud being "someone else's computer" has a certain truth to it. Edge computing gives back some control that businesses enjoyed with on-premise deployments—but not at the expense of all the benefits offered by cloud.

Automation is vital to making this work.

One micro cloud is manageable, but moving the compute closer to the edge of the network means replicating work across lots of edge devices. Managing this through open source software that enables the deployment and management of micro cloud through APIs is not just desirable but necessary.

Given fintechs have blazed a trail when it comes to APIs and automation, micro clouds can be quickly adopted and aligned to individual use cases. And we shouldn't be fooled by the "micro" in micro clouds. Edge computing could be one device, a micro cloud could be as few as three and as many as 20. Edge computing is not one thing—like the cloud it can expand to meet needs and shrink to manage costs.

Here is a checklist that shall help fintechs take an informed view of their need for micro clouds

- **Is there a need for improved processing power?**
  Edge computing may be better equipped to deal with, for example, micropayments at mass scale.
- **Is there a need for very low latency?**
  If fast decisions are necessary, for example when dealing with stock prices, the simple limits of the speed of light may make the cloud a bad choice.
- **Is real-time data analysis necessary?**
  Sending large amounts of data to the cloud for analysis and waiting for the results may both take too long and also involves moving a lot of data to the cloud which incurs high costs.
- **Is the cloud costing too much?**
  The cost benefits of cloud has been touted since its inception, but its elasticity means that costs can quickly spiral out of control. By ensuring that certain compute functions are at the edge of the network instead, cloud costs can be better controlled.
- **Is it necessary to boost API strategies?**
  Fintechs are excelling when it comes to the creation and use of microservices to build their products. But where should these live, and how should these connect? Micro clouds could better underpin the use of APIs and microservices.
- **Is cloud the best choice to ensure resilience**? Edge computing means not every egg is in the same basket, adding redundancy where it's needed. Some fintechs have suffered high-profile outages that risk the trust they have built, making resilience through a mix of technologies more attractive.
- **Is your data where it should be?**
  Regulation and compliance worries mean that fintechs should make sure that every piece of customer data does not end up crossing borders it shouldn't. Instead of relying on a cloud provider to provide this assurance, and potentially limiting your options, micro clouds can make this possible.

Edge computing and fintech

So fintechs should not be ripping out their cloud infrastructure to replace it with micro clouds as they did with on-premise. Instead, they should be looking to evolve their cloud provision by identifying where exactly the cloud isn't quite meeting their specific needs. Ultimately, the choices to be made are all about data. Fintechs are dealing with increasing amounts of data and need to understand how it is protected, where it is at any time, what laws apply, and what this data is costing the business.

There is a good chance that micro clouds could help address some, if not all of these challenges.

2021 is the year to start planning, identifying where the problems lie and what cloud strategies could help.

'2021 is the year to start planning, identifying where the problems lie and what cloud strategies could help.'

Sustainable fintechs require the right tool for the job

In order to not just survive, but thrive, fintechs need to prove they are capable of being sustainable businesses. Burning through investor cash with no proper business plan, or hoping to be bought by a major player, is no longer viable. Fintech is an established sector and as such expectations are different—plus circumstances have conspired to make investors more wary. Moonshots are way less attractive. Having a solid and sustainable path to the future is the only way forward now.

‘In order to not just survive, but thrive, fintechs need to prove they are capable of being sustainable businesses.’

Part of being a sustainable business is using the right tool for the job. Edge computing is one such tool. The use of micro clouds can support innovation, resilience and compliance while also keeping costs low—when applied correctly.

Cloud has been the home of innovation for a decade. Edge computing should be part of the toolset, as fintechs evolve to use the best solutions to underpin what they are doing. Crucially for 2021, the fintechs that start thinking about this now will remain two steps ahead of incumbents, especially those who are only now getting to grips with cloud—and one step ahead of rivals who see the cloud as their final destination.

‘Cloud has been the home of innovation for a decade. Edge computing should be part of the toolset, as fintechs evolve to use the best solutions to underpin what they are doing..’

Microclouds have multiple uses, however there are three main areas fintechs should focus on now.:

- **Cost:** Cloud costs can get quickly out of hand. Microclouds can be more sustainable. Fintechs should identify where costs are spiraling as a matter of course, and control those costs fast. Micro clouds may help.
- **Regulation:** This is set to be the major issue for many fintechs in 2021. Regulators want customers to be able to trust their providers, and are prepared to step in where required. Exactly where data is being stored and transmitted is vital to compliance and the protection of customers—and use of technology to stay compliant will help reassure them.
- **Security:** There are worries that edge computing is less secure than cloud, but keeping both cloud and microclouds secure relies on the same principles. Any technology is insecure without good procedures and trained people that follow those procedures. Ensuring good practice is far more effective than choosing one technology over another.

Kris Sharma is the Financial Services Sector Lead at Canonical - the company behind Ubuntu. one of the most popular linux operating systems from public clouds to the edge. Over the last two decades, Kris has held various senior leadership positions at Big 4 advisory and consulting firms providing advisory services to Fortune 100 and FTSE 100 clients. Kris’ consulting and management experience spans multiple sectors including Financial Services, Media & Telecommunications, Public Sector, Automotive and Retail. As a trusted C-level advisor and business-tech leader, he has been able to influence enterprise strategies to focus on building innovative solutions for end-users and communities across the globe.

Not everyone can buy innovation

Teodor Blidăruș, CEO and Co-Founder of FintechOS

fintechOS

Fintech has a "squeezed middle" problem. The prevailing narrative is that fintech providers and challenger banks have the big incumbents on the run—they cannot hope to keep up with their fast innovation, superior user experience, and nimbleness that can make change happen. And while the big providers may not be able to do the same, it doesn't matter: they have deep pockets.

A big bank with a multi-million dollar budget to spend on digital transformation is never going to be left behind for long. It can simply buy its way out of trouble. We've seen acquisitions happen, such as Orange Bank buying Anytime, but the simpler way to innovate is to follow the herd—let others experiment and when success strikes, copy it.

Meanwhile challengers have enjoyed around five years of burning through investor cash. Recently, we have seen these challengers make more noise about increased revenue and moves towards profitability, but there was still half a decade where money wasn't an issue, making innovation far easier.

But not every financial services provider is a big incumbent or hotshot challenger. A great deal of "tier two" providers find themselves with the need to innovate to survive, but without the investors or reserves to just throw money at the problem. They risk being left behind—but they are also the canary in the coal mine. The problems they face right now—the need to innovate but without the reserves of cash to make this easy—are the same challenges that most financial service providers will soon face, no matter their size or position in the market.

Innovation and digital transformation are both necessary and expensive, but all providers will need to justify if where they are investing is going to provide the right return. With the human resources required becoming ever scarcer and therefore more expensive—developers are in demand by every industry, not just fintech—ensuring return on investment is not easy.

Better innovation is possible through collaboration

At the core of this problem is the question: What is innovation?

The last decade of fintech may have left us with a false impression of what the term implies. Sure, the industry needed a radical shake-up to change how things were working—creating mobile apps with a pleasant user interface, making product suites less arcane, and revolutionising the way financial services and customers interact.

But not every innovation has to be totally revolutionary to be important.

Most providers would agree with the idea that their products and services need to be data-driven and customer-centric across all their product lines. Reducing friction and increasing automation is crucial, so that the context of each customer is important. Rather than simply the look and feel of financial services, there needs to be a more personalised and data-centric approach to product design and the customer journeys. Contextual relevance can lead to increased acquisition.

We may have moved online and prefer automation, but the desire for the personal touch hasn't gone away. We still want providers to recognise our exacting needs. Unfortunately, creating this level of personalisation has the potential to be costly—developer time isn't exactly cheap at the moment, and hiring developers is a fight over a very limited resource.

'Innovation and digital transformation are both necessary and expensive, but all providers will need to justify if where they are investing is going to provide the right return'

How low code can change the game

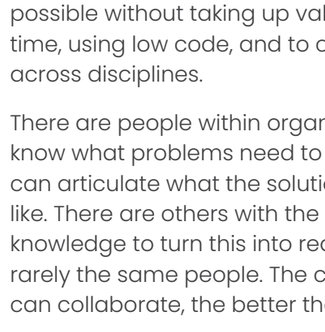
Financial services finds itself in a bind. It needs developers to fix its problems, and a financial squeeze is either here or heading its way soon. The solution is to make some development possible without taking up valuable developer time, using low code, and to collaborate across disciplines.

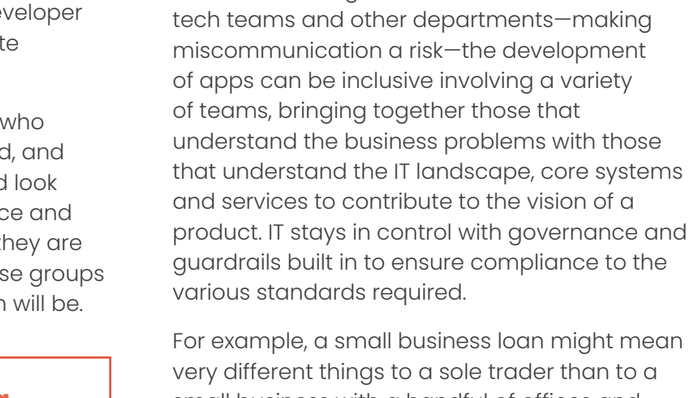
There are people within organisations who know what problems need to be solved, and can articulate what the solution should look like. There are others with the experience and knowledge to turn this into reality. But they are rarely the same people. The closer these groups can collaborate, the better the solution will be.

'It requires little coding knowledge or expertise, meaning software development or the creation of business applications can include staff with non-technical backgrounds.'

Low-code is the best way to foster this collaboration. It requires little coding knowledge or expertise, meaning software development or the creation of business applications can include staff with non-technical backgrounds. Instead of having a back and forth between tech teams and other departments—making miscommunication a risk—the development of apps can be inclusive involving a variety of teams, bringing together those that understand the business problems with those that understand the IT landscape, core systems and services to contribute to the vision of a product. IT stays in control with governance and guardrails built in to ensure compliance to the various standards required.

For example, a small business loan might mean very different things to a sole trader than to a small business with a handful of offices and staff approaching three digits. The information required to process such an application may be different, as would the approach needed to guide the customer through. By using low-code business experts can create this using a graphical interface, just as they would draft a proposal using Word or create a spreadsheet using Excel. It means that people with "big ideas" can have a far better impact on what is achievable.





Low-code is glue, not a strategy

This low code approach can change how a financial service provider innovates, but it's important to remember that it's not, on its own, a strategy. Rather it enables a strategy and makes faster innovation possible.

Low code is glue that makes different parts of the business work together, overcoming siloes without taking developer time to achieve every step. There needs to be APIs created, data shared, and a culture of openness. Low code is the glue that will bring this together, a vital part of a greater strategy to foster innovation.

Ultimately, we see low code being adopted across financial services and beyond. Developers are irreplaceable, and low-code means they can tackle the challenges only they can solve. Low-code is undoubtedly the future of development within businesses, enabling them to keep pace with the market by making the most of all of the expertise that sparks innovation.

'Ultimately, we see low code being adopted across financial services and beyond. Developers are irreplaceable, and low-code means they can tackle the challenges only they can solve.'

Teodor Blidăruș is CEO and Co-Founder of FintechOS, which he established in 2017. Teo has been working in the financial technology industry for almost 25 years, and has led the roll-out of technology for banks and insurance companies worldwide. In fact, he has founded and scaled several companies—three of which now serve Fortune 500 customers in 30 international markets, and have increasingly high valuations. During his 25-year career, Teo has actively supported entrepreneurs on the path to maturing their businesses, encouraged investments in software intellectual property, and continues to promote several key markets as central hubs for international IT services integration.

To sum up:
Going with and beyond the hype

People complain about hype, but it's often incredibly useful. Often a "buzz" around something is a good way to find the best film, the best restaurants, or even the best fintech technologies.

What we're really annoyed about is overhype, when the movie or meal turns out to be way blander than expected, or even just unavailable. Technologies are a little like the tentpole superhero blockbusters that set out their release schedules years in advance. Are we really supposed to get excited now for something that will be released in four years?

But there's also underhype—if we're stretching the cinema metaphor, this is the Sundance winner that never really gets the box office attention it deserves. It could have a profound impact… but it doesn't as no one really pays it much attention.

We're often warned about the dangers of hype, but the five technologies we identified that will change fintech over the next five years all have a unique story to tell about how different the popular narrative is from their reality.

APIs are here now but will continue to change the fintech sector through embedding services and integrations. AI is seen as a future technology but is part of many fintechs right now. Blockchain has found its place in many businesses, yet has a reputation as being a solution without a problem. Low-Code is at least part of the solution to the problem of a lack of developers, yet it doesn't yet have the hype it deserves. And Edge Computing is perhaps too technical to have cut through, but its advantages will become better understood in time.

Fintech has been described as a revolution, which brings with it an idea of an instant change—an overnight coup that sees the old guard exiled (or worse) and the new upstarts in charge. But fintech is an ongoing change in the financial services industry. It means new ways of doing things and it means a different approach to technology.

Technological change is never done, and the fintech sector needs to keep this in mind with its approach to new technologies. "Looking beyond the hype" is more than a simple platitude. There is a need to look at the merits of technologies

'The five technologies we identified that will change fintech over the next five years all have a unique story to tell about how different the popular narrative is from their reality.'

and their applications with an eye not just on today but on tomorrow. There needs to be an understanding of not only the technology but what it can enable. And there has to be an openness to change as technologies become cheaper, more practical and simply better.

Fintech is not really a revolution and more of an ongoing process. For its continued success it needs to adapt and embrace new technologies, not just the ones that made the initial fintech decade possible.

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