

The Connected Business

Wednesday October 14 2015

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Start-up threat to creaking banks

Lenders are alarmed by the inroads being made into their territory, writes *Patrick Jenkins*

To judge by her CV, Anne Boden is an old-style banker to the core. She has a conventional career behind her, spanning stints at Lloyds, Standard Chartered, UBS and Royal Bank of Scotland, culminating as chief operating officer of Allied Irish.

Now, however, Ms Boden has moved into the vanguard of the digital revolution. As chief executive of Starling Bank, a London-based start-up, she believes the future of high-street banking is not on the high street at all, but on mobile-only platforms such as the one she is midway through setting up.

"Big banks are far too complicated. All their branches and products and legacy systems are very inefficient," Ms Boden says.

And she is not alone in holding such views. Across the financial services sector, but particularly in banking, start-ups are endeavouring to shake up a staid industry.

Three connected complications make this a rich vein to tap. In the boom times of the late 1990s and early 2000s, many banks failed to invest in technology, preferring simply to ride the wave and maximise profits. During the financial crisis, meanwhile, there was no time to think of tech investment. And in the post-crisis period there has been no money. The net result across much of the world is a banking system that is creaking at the joints.



The industry has been distracted for years, says Piyush Gupta, chief executive of DBS, Singapore's biggest lender. "Collectively, we have taken our eyes off Net 2.0."

Groups that expanded aggressively through acquisition have some of the

biggest challenges thanks to a common failure to integrate multiple IT systems. Kartik Ramakrishnan, senior vice-president at Capgemini, a consultancy, says the task in hand is vast.

"The financial services industry is one of the biggest spenders on technol-

ogy," he says. "However, the majority of this spend is on maintenance activities, largely due to the investment required to keep legacy systems operational."

Royal Bank of Scotland, which led a three-way €71bn acquisition of ABN Amro just before the financial crisis,

has become synonymous with IT failures. After RBS's systems fell down in the summer of 2012 it took weeks to clear a backlog of 100m unprocessed transactions that froze customers out of their accounts.

Despite a £750m programme of investment, RBS was hit by another embarrassing glitch this summer.

Some of the biggest banks with the greatest need to make amends for past under-investment are now spending billions of dollars a year – not just to maintain old systems, but to try to upgrade them at last.

"There is an urgent need for the traditional players to acknowledge the presence of new digital challengers," says Mr Ramakrishnan.

"[Banks need] to develop more agile, responsive IT to support faster time to market, better product innovation and improved customer service."

DBS of Singapore is among the banks convinced it still has time to make amends. Next-generation technology is now "front and centre of our priorities", says Mr Gupta, who adds that the timescale for getting it done is limited.

"If you don't get the digital transformation right in the next five years, you will be history," he says.

As with other bank bosses, Mr Gupta is alarmed at the inroads made into traditional banking territory by non-banks, particularly technological behemoths, from Alibaba in China to Apple across much of the rest of the world.

Their expansion into payment services is particularly worrying for the banks because it directly challenges the banks' relationships with their customers.

Other core banking activities – such

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Hold the phone: many of the mobile payment functions used across Africa are still basic forms of money transfer and telephone call top-up services — Alamy

Mobile payments promise much, but the developed world still plays a waiting game

Smartphones Financial services applications need to evolve further to gain wider acceptance, reports *Daniel Thomas*

High-profile mobile money launches by Apple and Samsung may have caught the headlines — both have recently joined the ranks of companies offering mostly wealthy owners of expensive smartphones the ability to pay for goods with a swipe of their handsets. But it is the developments in payments systems in supposedly less developed nations in Africa and Asia that point the way to the probable future for wider mobile banking.

More than \$30m in transactions were made in the first month in South Korea with Samsung Pay alone. Thomas Ko, vice-president of Samsung Pay, says “not enough [had] been done to date to offer a viable alternative to the wallet”. Samsung’s “wallet” lets the owners of its phones make contactless payments at the point of purchase, as well as online payments.

But while Samsung and Apple will undoubtedly help the use of mobile payments to spread, the reality remains that the mobile phone as a means of payment remains relatively niche even in developed markets.

In the UK, for example, just 1 per cent of people use their phones to make payments on a daily basis, according to Deloitte, even if more are beginning to sporadically test services as big retailers adopt contactless payment systems.

Mobile payment schemes mostly copy the basic payment premise of debit and credit cards, as well as the wallets

that many people still carry. This makes them a high-tech alternative rather than an obvious upgrade for some people, even if mobile payments usually offer better user identification and authentication than cash or cards.

But analysts anticipate a further shift as more financial services and greater interactivity are added, which is when mobile payments will become mobile banking. Countries in sub-Saharan Africa and Asia, where traditional banking systems are less well entrenched, already point the way.

Mobile users in developing nations do not necessarily want to use their phones just to pay for food at the supermarket as, sometimes, they do not even have a bank account. Instead, the mobile phone is taking on extra roles as a place to keep money safe and move it around, as well as to acquire other financial services from trusted providers.

Mobile wallets in developing nations have become a means of providing a stored value account through which to receive a payment on a mobile device and turn it into cash through an agent.

According to Juniper Research, mobile devices have enabled people in “highly underbanked markets to achieve first-time financial inclusivity” and it found that more than 15 countries had more mobile money accounts than bank accounts at the end of 2014.

Many of the mobile payments services in Africa remain forms of money transfer and airtime top-up systems pioneered by schemes such as

Vodafone’s M-Pesa, where people can move money and pay for goods.

But services are quickly expanding to include loan disbursement, bill payment and micro insurance. Juniper cites India as a case in point. The most popular wallet is Paytm, but new entrants have been granted approval to provide a wider range of products such as acceptance of deposits and fund remittances.

Mobile phones are also expected to take on extra financial functions in the future in western markets.

Paula Felstead, chief officer for business strategy and direction at Visa Europe, says that the first wave of mobile banking apps has been focused on pure banking — the moving of payments from, to and between accounts.

But, she adds, consumer behaviour and technology advances could well change this with new ways to move money between people that is driven by mobile access. “That means a far broader sense of the term ‘mobile banking’ becoming commonplace — and therefore an evolution of what mobile banking apps need to be able to do.”

Stephen Ley, financial services partner and payments specialist at Deloitte, says that mobile banking apps have already overtaken branch and online interactions with customers, even if much activity is just balance checking.

“In the next few years mobile banking apps will become the predominant means to access all routine banking services, from applying for a loan or

overdraft increase to letting the bank know you are moving house,” he adds.

Banks need to lead the change in consumer behaviour, according to industry executives, given their trusted status and the strict licenses needed to extend into other financial services.

“Consumers are being surrounded by new payment choices every day but even in this digital age they continue to trust their banks the most for their financial needs,” says Mark Barnett, president of MasterCard UK and Ireland.

He adds: “So while we are working closely with digital giants such as Apple, Samsung and Google to roll out their payment services, we’re also working with the banks to create their own payment functionality embedded within their existing hugely popular banking apps.”

But Julien Duvaud-Schelnast, manager at Arthur D. Little, a US-based consultancy, says mobile banking is still in its infancy. He expects the market to expand into new areas such as direct debit payments, and he adds that more than half of smartphone users in the US used mobile banking services in 2014. So far, however, he says mobile is mostly acting as a complementary channel for basic activities, such as balance checks, rather than providing the main route of access to banking activities.

In terms of providing access to a full range of banking services, it seems that mobile still has a long way to go.

Start-up threat to creaking banks

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as lending — are under attack from technology start-ups, particularly so-called peer-to-peer (P2P) lenders.

By using sophisticated software to match people or companies with money to lend to those who want to borrow, they can often offer loans more cheaply and cut out the middlemen bankers. “We are steadily taking their customers,” says Giles Andrews, co-founder of Zopa, the world’s oldest P2P lender, who adds: “We are doubling our market share every year.”

A handful of initiatives pose similar threats to other areas of the traditional financial services market.

In asset management, for example, Alibaba has attracted vast inflows across China, thanks to the combined power of its technology and its dominant brand name.

In insurance, a patchwork of initiatives has spread across broking and analytics.

It is in banking services, however, that the greatest changes are afoot. Here, technology companies, large and small, have been helped in their competitive efforts by the increasing regulatory constraints imposed on traditional banks in the aftermath of the 2008 crisis.

While banks have been forced to accept tougher regulatory capital requirements, making much of their core lending more expensive, challengers from outside banking are only lightly regulated.

In some countries, politicians have even gone out of their way to favour non-banks, conscious that there are votes to be won in making life harder for the kinds of banking institutions that were so closely identified with the financial crisis.

In the UK, for example, P2P lending is about to be given the tax breaks and government imprimatur of an Isa, a tax-efficient savings vehicle. At the same time, a new 8 per cent bank supertax has been announced for old-style banks.

The banking industry is not taking the assault lying down. With the trauma of the crisis, and much of the expense of post-crisis regulation now absorbed, the stronger banks have not only begun to invest

heavily in unseen back-office IT. There is also a good deal of customer-facing tech investment, ensuring that some banks, at least, are keeping pace with upstart challengers.

A number of models are emerging. Spanish lenders BBVA and Santander have each set up pools of funding to buy up tech-based firms. BBVA even went so far as to acquire Simple, one of the more eye-catching of the US start-up lenders. Meanwhile, BNP Paribas has established Hello, a mobile-focused lender operating across a large chunk of the eurozone.

For Ms Boden at Starling, such initiatives miss the point because, in most cases, the high-tech front ends of the new style still rely on old bank infrastructure.

Of her own enterprise she says: “We’re different. We’re going to be able to offer free current accounts without subsidy from other products.”

“That’s because we don’t have the big network overheads of branches and legacy systems.”

If she is right, then perhaps the greatest potential for a more modern form of banking may lie in emerging markets, where old-style infrastructure was never built.

Across Africa, for example, payment services using basic mobiles rather than smartphones are already widely available. In such markets, tech-savvy start-up lenders could do very well indeed.

Many believe, however, that the current phase of traditional financial services being challenged by upstart technology companies will morph into a new world order, in which the best of the old operators integrate the latest technology, either under their own steam or via acquisition.

“The financial services industry is at a crossroads,” says Mr Ramakrishnan. “But we firmly believe that some firms will retake the initiative and challenge the new digital challengers at their own game.”

“Indeed, we may see symbiotic relationships emerge, where both established firms and challengers come together to create a mutually beneficial partnership.”



Six start-ups that aim to take a cut from longstanding institutions

Fintech

Murad Ahmed looks at some newcomers threatening banks’ old hunting grounds

The aim seems to be to inflict death by a thousand cuts. Banks and financial institutions are huge whales — sprawling businesses built over decades that make them seemingly impenetrable to the technological disruption faced by other industries.

But “fintech” start-ups are nimble piranhas, each focusing on a small part of a bank’s business model to attack.

If enough of these start-ups have an impact, the banks could suffer from a slow bleeding of their overall revenues. Here is a guide to some start-ups that are aiming to take income from the banks.

Adyen This Netherlands-based company is attempting to cut banks out of the payments process, both online and in stores. It already handles online payments for companies such as Netflix, Spotify and Uber.

But it is now expanding its technology offering to allow merchants to take

in-store payments using internet-connected devices.

The idea is to free retailers from using multiple payments systems and instead plug into a single global platform. This allows any store — online or not — to accept payments in multiple currencies using more than 250 methods, from credit cards to Apple Pay.

Adyen’s payments platform can also capture information about customers as they buy across multiple venues, thus allowing it to provide additional services such as fraud detection and loyalty schemes.

Investors have valued the company at \$2.3bn, making it one of Europe’s most valuable private tech companies.

GoCardless The London-based company allows small businesses to take direct debits or recurring payments, such as monthly subscriptions, via apps or websites.

GC’s charges change according to the volume of transactions, but they are generally 1 per cent per transaction, capped at £2.

Although this is not significantly cheaper

Cash call: a ‘digital wallet’ that allows users to store, send and trade bitcoins



than banks and other payment processors, GC says that its systems are easier to access and use. In January, it secured \$7m from investors including Balderton Capital, Accel Partners and Passion Capital — some of Europe’s leading venture groups.

iZettle This Swedish company has created credit card-reading devices that can be attached to phones and tablets, allowing individuals and small businesses to take card payments. This means that even market stall holders and ice-cream van owners can process such payments.

Its main rival is Square, the San Francisco-based group started by Twitter co-founder and CEO, Jack Dorsey.

The company has ambitions to expand into other areas, including lending. It has also launched iZettle Advance, a financial product that provides businesses with small cash advances that are returned automatically as a percentage of future card sales.

Stockholm-based iZettle has gained more than \$157m in funding since its founding five years ago.

Coinbase This San Francisco start-up is at the vanguard of companies building businesses around the bitcoin, the digital currency. It has created an online wallet that allows people to store, send and accept bitcoin payments. It has also launched an exchange that allows people to change real-world money into the cryptocurrency.

Investors see bitcoin as a serious threat to the established financial order. Earlier this year, Coinbase became the best backed bitcoin company in the world when it secured \$75m from investors including US venture capital groups DFJ, Andreessen Horowitz and Union Square Ventures.

What caught the attention of the industry was the presence of traditional finance groups in this funding round, including the New York Stock Exchange, Spanish bank BBVA, and the former chief executives of Citigroup and Reuters.

Earlier this year, Coinbase launched its services in the UK and it is now planning further international expansion.

Wealthfront This US start-up offers an “automated investment service” — software that automatically makes investments and financial decisions

for its clients — work traditionally done by well-paid asset managers. Wealthfront claims that its algorithms are just as competent, and will open up investing to the less wealthy.

In March, the company announced that it held more than \$2bn in assets for 22,000 clients — and had saved those clients nearly \$10m in financial advisers’ fees.

Based in Palo Alto, California, Wealthfront has raised close to \$130m in funding, including from leading US tech investors such as Index Ventures, Greylock Partners and Spark Capital.

Osper A London-based start-up that offers mobile-only banking services for children while providing parents with a degree of control over their children’s cash. Osper creates current accounts with separate login details for parents and children. Accounts, which have no credit or overdraft facilities, are accessed via an app.

Osper also creates pre-paid debit cards, which can be used to make withdrawals at cash machines, or for in-store or online purchases.

It is currently a UK-only service but it has raised \$10m from investors, including Index Ventures.

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Banks put aside suspicion and explore shared database

Blockchain Innovation will speed up trading times and movement of assets, says *Kadhim Shubber*

At first bitcoin was viewed with suspicion by the banking industry. The currency was known more for its association with anarchist hackers, online drug sales, and disasters like Mt. Gox than for the technology underpinning it, blockchain.

Suspicion has turned into a deep embrace. Now blockchain, an innovation in running shared databases, is touted as the technology that will drag financial services into the 21st century. The world's largest banks are taking a tool whose creator intended it as a weapon against them and adopting it in a bid to reduce costs and increase profits.

Few people working outside of finance would guess at the inefficiency of some banking systems. While high-frequency trading conjures thoughts of split-second trades and the break-neck swapping of shares on electronic markets, settlement is measured in days. Instead of complicated algorithms, fax machines are still in common use. The syndicated loan market is held up as emblematic of this slowness; deals can take 20 or more days to complete.

Simply put, there's a lot of financial machinery that is "very manual and typically very paper-based," says Simon Taylor, blockchain and distributed ledger lead for Barclays, which is backing startups using blockchain to digitise everything from shipping documents to the diamond trade.

In addition to their individual projects, the banks have thrown their

weight behind R3, a company that is developing a blockchain network for use by the financial services industry.

More than 20 global banks, including the likes of Bank of America, Goldman Sachs, HSBC, JP Morgan, and UBS, are now backing the company as they look to blockchain as a means of upgrading that manual back-office machinery.

It is not the only game in town. Nasdaq, which owns the technology-heavy US equity index and exchange, has partnered with a San Francisco startup Chain to develop a private trading platform. Chain counts Nasdaq, Visa and Citi Ventures among its investors.

Blythe Masters, the former JP Morgan banker, is leading her own blockchain startup, Digital Asset Holdings. She has said the benefit of such systems ultimately lies in reducing the time it takes to trade and move collateral.

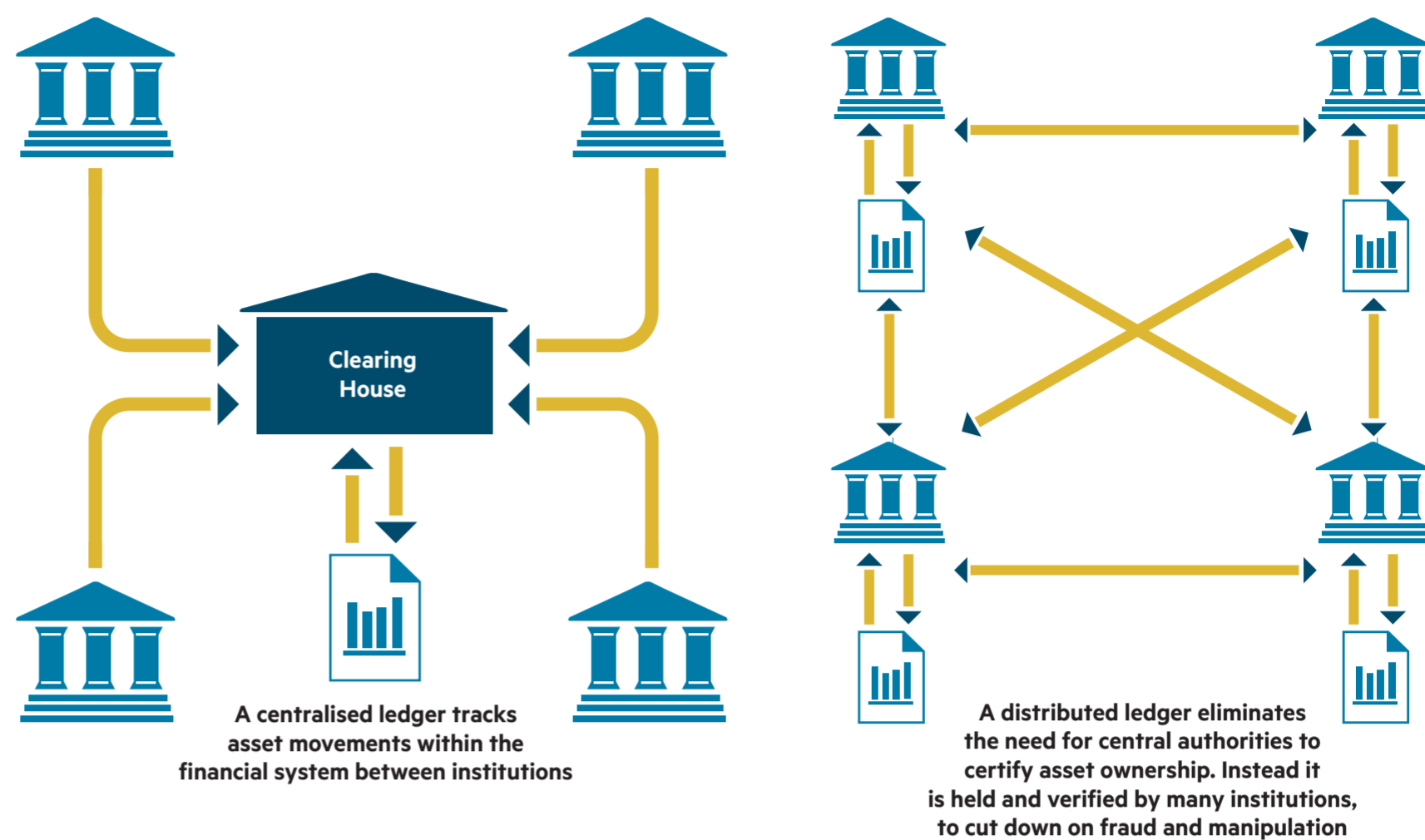
"If you can speed up the process via which assets change hands, capital requirements will drop because there is a resulting lower rate of operational risk and counterparty risk," she said at a recent conference in New York, organised by CoinDesk.

The savings are potentially massive. Santander InnoVentures, Anthemis and Oliver Wyman have estimated a possible \$15-20bn cut in costs for cross-border payments, securities trading and regulatory compliance.

Although the technology is underpinned by complex cryptography, it can be thought of as simply a means of running a database that is stored in multiple

How bitcoin works: distributed ledger technology

A distributed ledger is a network that records ownership through a shared registry



FT graphic Source: FT research

locations and is controlled by no single party. The term blockchain is sometimes interchanged with the term "distributed ledger technology".

It is the innovation that has powered bitcoin. Instead of relying on an entity like a bank to manage their money, users of bitcoin can freely access a global database, create their own cryptographically-secure account in that database, and then adjust the entries in their account (receive and send payments).

In the bitcoin network, the currency is an incentive for anonymous actors to maintain the system, but for banks, the focus is on blockchain without bitcoin, or without a monetary token to incentivise users of the system.

"It's completely unnecessary in the world of banking where you have trusted relationships and a legal regime," says David Rutter, chief executive

of R3. Instead of an open system accessible to all, the efforts are focussed on building closed systems that are maintained by a pre-approved group of institutional users.

The hope is that building a common rail for the movement of assets, instead of each bank managing their own separate systems, own, will reduce friction in the exchange of assets. "Every bank has an accounting engine that does broadly a same thing, so does it make sense that you could share that burden," says Simon Taylor of Barclays.

There are still huge challenges to overcome and few are expecting rapid, dramatic change, or "open-heart surgery on the core engines," as Mr Taylor puts it. Regulators are only recently got a handle on how to treat bitcoin - the ramifications of widespread

adoption of blockchain technology are just now beginning to be considered.

There is also scepticism about the ability of banking to keep up with the pace of innovation bitcoin has sparked, not least from early and continued believers in the currency. Barry Silbert, whose Digital Currency Group is the most prolific investor in bitcoin startups, notes banks are the "slowest moving, risk averse, cautious organisations in the world".

But what's obvious is the emergence of bitcoin and now the focus on blockchain has kicked bankers into action and has forced them to rethink the infrastructure that underpins finance. As entrepreneur David Galbraith recently pointed out, "blockchains have created the market awareness and incentives to innovate as much as the technological means."

Few people working outside finance would guess at the inefficiency of some banking systems

Applying the brakes is the new way to try to beat the market

High-frequency trading

The race to cut transaction times could be at an end, reports *Philip Stafford*

High-frequency trading (HFT) attracted public attention with the flash crash of May 2010. The story of the market dropping 400 points in minutes and rebounding because of superfast technology opened a window into a world that only traders, executives and boffins previously knew about.

Following that came further tales of barely credible uses of technology. Software and hardware were modified and made hyper-efficient to save microseconds and reduce "latency" - the delay between a computer click and a deal's execution.

Tens of millions of dollars were spent on drilling through mountains and laying 3,000m of fibre optic cables under the Atlantic so that a handful of traders could shave off a few milliseconds and beat their rivals to the trade.

Small trading firms paid exchanges for the privilege of putting their own servers in the same data centre where exchanges had their engines - the literal, physical heart of modern trading. Microwave links and radio masts were built to send signals even faster than via fibre optic cable.

However, that frenzied period may also have been the high point of easy profits. Other traders have since caught up, using hosted or outsourced services in data centres. What had been cutting edge technology soon became commoditised.

"We are now reaching a point where further latency reduction is both extremely costly and potentially counter-productive," said Norges Bank Investment Management, a sovereign wealth fund, in a paper in August.

"Low-latency communication through microwave links is fast approaching physical limits. The race to zero is almost over."

Until recently, regulators have sought to clamp down on the industry either by improving transparency or by enforcing existing trading rules.

European regulators have gone furthest, requiring more information about the algorithms used and setting tougher standards for testing. But other proposals around testing have been eased, with regulators keen not to stifle innovation or deter entrants to the market.

[Meeting regulatory requirements] definitely won't be an easy requirement for all firms... but given that it's a very difficult technical subject, they've done a pretty good job of balancing what is necessary from the regulators' point of view.

'The industry has spent millions getting faster and IEX wants to slow down'

view and what is possible from a technology point of view," says Johann Ladd of the FIA Epta, a trade association for HFT market makers.

But others say that the solution lies in using technology more imaginatively. IEX Group, an alternative trading system or "dark pool" that features in Michael Lewis's book *Flash Boys: A Wall Street Revolt*, is applying to become the newest stock exchange in the US, and plans to introduce a technological "speed bump" - just long enough to stop other market participants from reacting to trades and changing their orders.

This, says IEX, would allow investors to feel that they are not being exploited by a fragmented market of more than 40 potential venues.

"There's an irony here. The industry has spent millions on getting faster and faster round the racetrack, and IEX comes along and calls for people to slow things down," says Steve Grob, director of strategy at Fidessa, a UK trading-tech company.

IEX's plan requires all brokers trading on its system to connect to a single location from which their orders are sent through to its matching engine held in another data centre about four miles away. IEX estimates that a delay of about 350 microseconds will create the required delay. That equates to 38 miles of fibre optic cable, which is coiled and stored in a compartment the size of a shoe box in front of its matching engine. Other exchanges, such as Aequitas in Canada, use similar devices.

However, another violent US stock market dislocation on August 24 also served as a reminder that it is not so much the use of algorithms in markets, but what they are capable of that counts. The event also offered a salutary reminder of the relevance of human beings.

On that day, heavy selling from Asia drove demand for protection from options markets overnight, and futures indicated that there would be a steep drop when US equity markets opened.

As Marko Kolanovic, senior analyst at JPMorgan, noted: "HFT relies on speed of execution and stable market conditions that can be coded into an algorithm."

During the highly volatile opening on August 24, many high-frequency traders stepped back from the market as their computers struggled with unusual prices. Liquidity provided by an automated trading system is almost the complete opposite to that provided by a human, Mr Kolanovic added.

"HFT can execute millions of times faster, but cannot use judgment to understand and interpret large and novel dislocations in real time," he said.

Contributors

- Patrick Jenkins**
Financial editor
- Daniel Thomas**
Telecoms Correspondent
- Murad Ahmed**
European technology correspondent

- Kadhim Shubber**
Reporter
- Philip Stafford**
Editor, FT Trading Room
- Maija Palmer**
Social media editor

- Adam Jezard**
Commissioning editor
- For advertising contact: **Michael Duffy**, +44 (0)20 7873 4646, email michael.duffy@ft.com
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The Connected Business

How to make all passwords vanish in a heartbeat

Cyber security Standard access codes could soon become a thing of the past, reports *Hannah Kuchler*

Wearables have been used to track our steps, deliver emails to our wrists and monitor our sun exposure. But now connected devices on our bodies could help us access online banking systems.

Nymi, taken from the Greek suffix -onym for name, is experimenting with a system that lets people prove who they are with their heartbeat. Halifax, part of UK bank Lloyds, Canada's RBC and MasterCard are partners.

Everyone's heartbeat is individual to them, so by wearing a wristband that transmits the signal to the device being used for online banking, or even a till at a checkout, you can prove your identity. Shawn Chance, vice-president of marketing and business development at Nymi, says the company aims to "make all the passwords go away". "The idea of a password being used for security is almost eroded," he says. He adds people tend to keep a note of them in insecure places.

Banks want to better secure their systems from hackers, who like latter-day bank robbers are attracted to the money in their – now digital – vaults. There are also more sophisticated nation state attackers who desire not only cash, but data and seek to make a political impact by targeting an adversary's most prestigious financial institutions.

Many banks are cautious about

putting any extra burden on consumers, already stressed by remembering codes and passwords, and who prioritise convenient and easy access to their money over security.

Even Nymi is unlikely to be accepted as a wearable given its limited use. "We don't have any illusions that, in order for the device to be useful for an everyday person, it has to do a lot more than get you into online banking," Mr Chance says. So the company is making wristbands for employees that allow or restrict access to parts of the office or IT network as an additional feature.

Banking is often held up as the sector that has devoted great amounts of time and resources to cyber security. But the threat facing institutions is also changing fast, forcing them to regularly seek out new solutions.

Tammy Moskites, chief information security officer at Venafi, a digital security company that works with four of the top five US banks, says the types of attacks have changed since she worked in information security for banks six years ago.

In the past, she says: "What we found . . . was attacks were on online banking, wire transfers, man-in-the-middle phishing-type attacks, about intercepting or redirecting money, sending it to Nigeria, rather than to payroll."

Now attackers are using techniques that are harder to detect: "The nation



state type of attack is just stealing this information to show they can do it . . . the money is usually redirected to support the crazies of the world, terrorists, people causing havoc."

But as banks have moved towards greater encryption in the effort to keep data safe – even if it is stolen – they have created another problem. They cannot see what is moving in and out of their networks because it is encrypted.

"Banks, as well as other companies in general, encrypt more and more of their data," Ms Moskites says. "In the past, it was just the most critical information, things required by regulators, now they are going above and beyond that. However, when it is leaving their environment, the tools notoriously don't see that data, [making banks blind] to potential problems."

Some banks are trying to address this by making sure they know what is encrypted and why and are looking at ways to decrypt it briefly as it leaves the network.

Mark Nicholson, chief operating officer at Deloitte cyber security practice Vigilant, says banks are increasingly turning to analytics to try to identify who is moving money without placing a burden on their customers.

"What we're seeing is an unwillingness to implement technologies which would cause friction to the consumer," he says. "So they are using analytics on transactions to understand if certain types of transaction look anomalous – from a profile and history of the times of day you usually transact, from which general internet provider address, browser, machine details, etc."

Heartfelt security: the Nymi band uses electrocardiogram signals to validate an individual's identity

'What we're seeing is an unwillingness to implement technologies that would cause consumer friction'

US-based Vasco Data Security works with more than half of the world's banks to prevent account takeover and transaction tampering for online and mobile banking. John Gunn, a vice-president at Vasco, says US consumers are more focused on convenience and service than security because they have no lasting exposure to losses from hacking or fraud. "Here in the US, consumers don't care as much because their status as a victim is quickly and painlessly alleviated by their bank, and usually within 24 hours," he says.

As a result, Vasco has to focus on verifying customers' identities discreetly and it has about 20 ways to authenticate a mobile banking customer. "Most of them are done in the background, without the user even knowing they are happening," Mr Gunn says.

Technology costs more than it saves, but we are too scared to tell

INSIDE TECH

Maija Palmer



In an attempt to be a digitally savvy, modern kind of parent, I tried to get involved in *Minecraft*, the virtual building-block world into which my children seem to have disappeared recently. I turned out to be hopelessly inept at it.

I am not bad at computer games in general. I can still beat my seven-year-old son at retro games such as *Mario Bros*, and I am regularly drafted in to babysit my daughter's virtual *Littlest Pet Shop* animals.

But I am struggling with *Minecraft*. My blocks scatter randomly, I dig holes when I mean to build walls and I am bothered by the pixelated sheep that wander up to stare at me.

My son has built a replica Viking village in *Minecraft* while I cannot build a row of bricks in a straight line.

My daughter laughs out loud at my efforts. My son is more encouraging. "Don't worry," he says, his fingers sweeping balletically over the tablet screen. "I was like that at the beginning. You just have to practise lots."

I'm not sure I am willing to invest the number of hours my son puts in – he would, if allowed, spend every waking hour on his *Minecraft* town. This is not compatible with raising a family and holding down a full-time job.

However, it made me think about the cost of acquiring new technology and the productivity paradox. This is the inexplicable finding that investment in technology does not, in fact, seem to increase productivity. From the early 1970s to the early 1990s, corporate America invested heavily in computers but productivity – which up to then had been rising – took a dive.

And productivity has been similarly depressed recently, despite the introduction of smartphones and the internet into our working lives.

Economists, who have been struggling with this conundrum since Robert Solow first wrote about it in

1987, have four theories for what causes it: there are productivity gains, but we just do not measure them correctly; some individuals and companies make productivity gains, but these come at the expense of others – so there is no net gain; there is a time lag before productivity gains show up; there are no productivity gains because IT is so hard to manage.

Anecdotal evidence from almost any office supports a number of these theories. Time lost to fixing computer problems, for example, is familiar and significant.

Last year, a study by Aalto University and the Finnish Institute of

In an ageist office culture, I will feign enthusiasm for a badly performing platform

Occupational Health found that public sector workers waste, on average, four hours a week troubleshooting computer problems. That is a productivity loss of about 10 per cent.

The displacement effect – theory number two – is also easy to spot. My colleague Lucy Kellaway has written, for example, about the FT's expenses system, a program so loathsome and

complicated that it reduces users to a tearful rage. It is probably producing a beautiful efficiency saving for the finance department – at least I hope it is producing an efficiency saving for someone – at the expense of a vast productivity drop for the rest of the staff.

But my money is on a combination of theories one and three being the real answer. We have not so much miscalculated the output as the input. We are simply not honest enough – with ourselves and with our companies – about what it costs to learn to use a new technology. I can balk at investing hundreds of hours in becoming proficient at *Minecraft*, but I do not have this luxury of choice when it comes to the dozens of technologies adopted in the office over the past few years.

Some may doubt Malcolm Gladwell's theory that 10,000 hours of practice – around 416 days – are what is needed to become an expert. But what is indisputable is that the average number of hours of training time companies provide for employees each year is very far short of this, more typically in the high 20s or low 30s.

Only once in my life have I been on a technology training course of any substantial length – for two weeks, when I first started at the FT. Everything else I have learned since then has come in sporadic, hour-long workshops, or on the job, and I am not sure anyone has calculated the true cost of that.

Learning on the job is not cost free. When I pull a busy colleague away from his spreadsheet analysis to troubleshoot my tech issues, I am pretty sure productivity suffers for both of us.

One of the reasons why an honest calculation of technology costs does not happen is fear. At 40, I am right on the outer edge of the age at which I can express reservations about technology.

In a few more years I suspect I will not dare to, for fear of being labelled someone who simply cannot keep pace with modern life.

At that point, fearful of being marginalised in today's often ageist office culture, I will feign enthusiasm for a poorly performing technology platform rather than question its adoption. I will not admit to needing help to figure out a new tool – I will just quietly not use it. Or use it poorly.

And then the company – and the economists – will wonder again why the gargantuan sums spent on technology procurement are simply not paying off.



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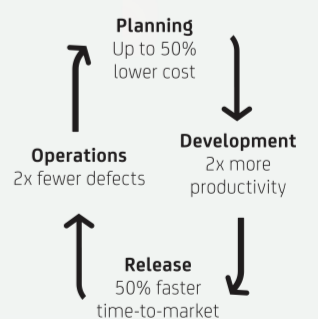
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