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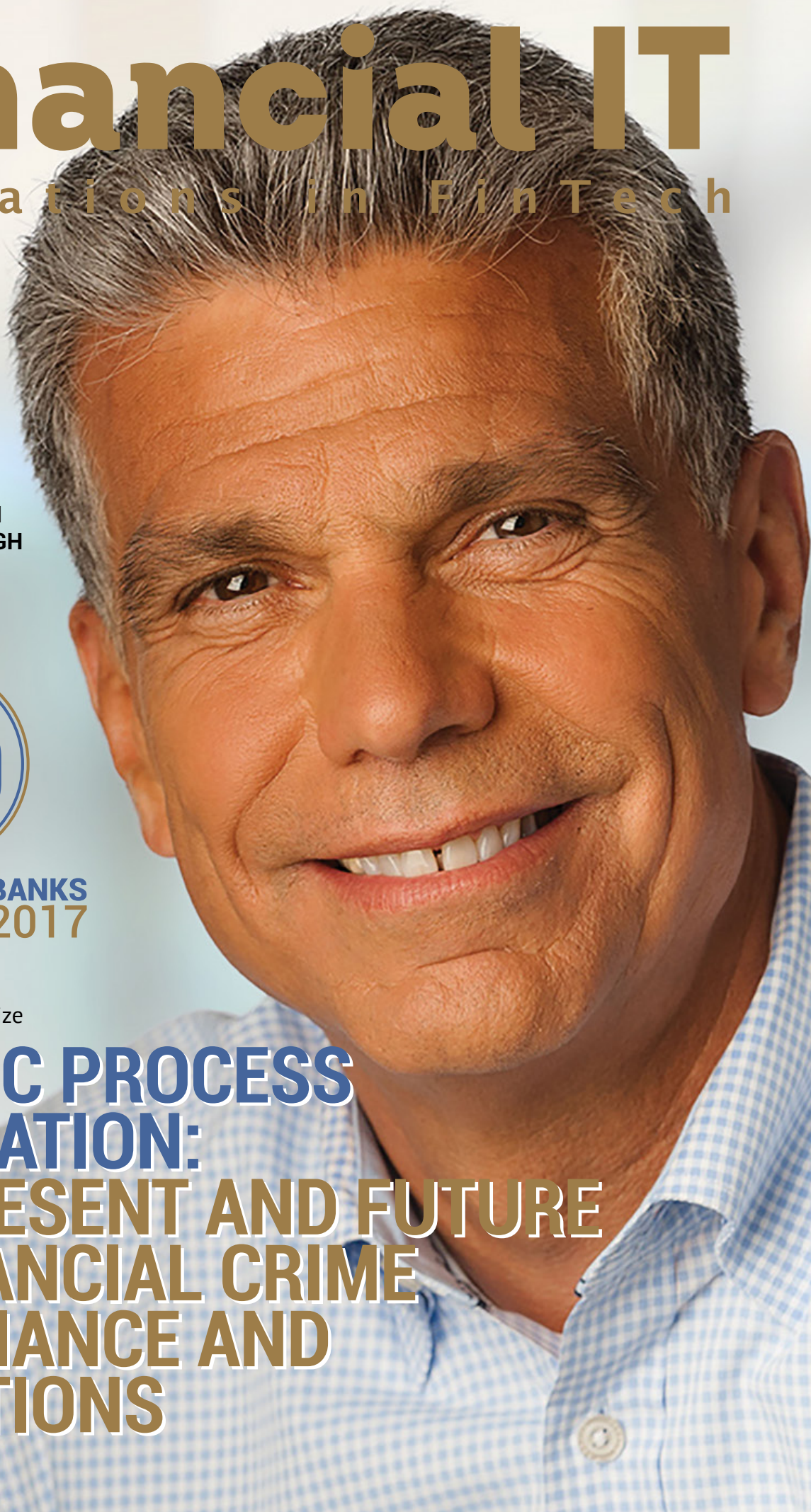
Financial IT

Innovations in FinTech



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SPECIAL SIBOS & MONEY 20/20 ISSUE 2017

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FINTECH GOES RETAIL

THE CAVALCADE SPEEDS UP, AND HEADS IN A NEW DIRECTION

Andrew Hutchings,
Editor-In-Chief

Landmark conferences such as Sibos and Money 20/20 are essential. Among much else, they provide a welcome opportunity to reflect on the state of the global financial services industry and ask: what is really new this year?

There is no doubt where the novelty comes from. The very name of Financial IT highlights how technology is the catalyst for change in financial services. Sometimes the innovations are developed by traditional banks and insurance companies. Other times, the innovations are developed by technology companies that have no intention of providing financial services. And, of course, there are many instances of disruptive FinTech companies - which seek to supplant traditional institutions.

Nor is there much doubt in relation to what the changes are responding to. In terms of the numbers of people involved, financial inclusion is probably the largest theme globally for the broadly defined financial services industry. The opportunity is to deliver world class products and solutions to hundreds of millions of people - mainly in developing countries - who have never even had a bank account before. The opportunity is made greater by the lack of legacy infrastructure in the local banks.

As several of the articles in this, and virtually all previous, editions of Financial IT indicate, regulation remains an important driver of change. Regardless of developments in other parts of the world, the European Union's latest incarnations of the Payments Services Directive (PSD2) and the Market in Financial Instruments Directive (MiFID II) are compelling financial institutions, technology companies and FinTech disruptors to rethink their business models.

As our publisher Chris Principe correctly points out in his letter, a big thing that has altered since Sibos and Money 20/20 in late 2016 is that the pace of change has increased at the intersection of financial services and technology. The cavalcade has accelerated, with the result that virtually all participants at the major conferences need to fill gaps in their knowledge. Relative to the past, the conferences are less about promotion of one's enterprise and networking, although these are still very important aspects.

Chris is right to highlight 2017's wave of Initial Coin Offerings (ICOs) as a key development this year for most of the financial services industry, and not just those who are involved with crypto-coins. ICOs represent an opportunity for massive retail participation in the funding of Venture Capital (VC) and Private Equity (PE). This is the latest development in the general movement towards empowerment of individuals - through better services and lower costs - that is embodied in the regulatory changes.

The movement of finance, technology and FinTech towards retail participants is reflected in our decision to cover digital banks in our latest survey of pathfinders in financial IT. To date, much of the development of digital banking has been driven by traditional institutions - in some cases, in response to the challenges posed by true FinTechs. The main message from our survey is that digital banks are still a new, rapidly growing and fairly under-developed community.

Bewilderingly rapid change and massive engagement of retail clients present huge opportunities for fraud. It is no coincidence that the top story in this edition of Financial IT deals with solutions that combat fraud and financial crimes. As ever, though, a number of our contributors discuss the technology and the infrastructure that underpins the financial services industry at a time that the cavalcade is speeding up and heading towards retail participants.

As ever, we thank our contributors and advertisers and wish everyone success at Sibos and Money 20/20.

ICOS AND 'I DON'T KNOWS'

Reflections on the latest feeding frenzy

Change is one of life's constants. However, we have not seen the current velocity and volume of change at Sibos since the Financial Crisis of 2008-09. Just before the Financial Crisis, we were literally dancing in the ballrooms of Austrian emperors. Within months, some of the biggest names in our business were facing collapse.

The changes were sudden, fast and final. Many observers believe that the changes were self-created by a lack of controls in our very own industry. However, the industry changed and we changed with it. Slowly businesses were rebuilt. It may be that we have not recovered the element of trust that banks enjoyed for so long, but we are no longer the butt of jokes. That marks real improvement.

Today as we meet at Sibos, we again are faced with radical and dramatic changes coming to our industry.

Unlike in 2008-09, these changes are coming mainly from outside the financial community and are potentially a threat. That people can store value today outside of traditional financial institutions through crypto-currency is radically changing the public's view of the usefulness of banking.

People can make payments today through their computer, tablet and, especially, their mobile phones. This is causing a shift in what retail customers need.

Meanwhile, companies and causes can be financed through crowd funding. This is shifting the focus from bank lending.

The newest change in Venture Capital (VC) is the availability of seed funding through Initial Coin Offerings (ICOs). The crypto-currency world is creating a revolution – changing the ways, amounts and speed of money raising for new ventures which in some cases are no more than ideas on paper.

Most of us are 'I don't knows'

With change of this speed and magnitude, nearly all of us at Sibos are 'I don't knows'.

Brutally disruptive changes are coming from outside banking as we know it, or knew it. Few of us can explain it or see the implications. Clearly some of what is happening in the crypto-currency world is being fueled by a lack of regulation. The rules have yet to be written. The regulators are in the same boat as the rest of us.

The crypto-currency world is home to a feeding frenzy. ICOs are raising funds for any project or idea with a whitepaper. This is due to the quick rise of the market value of Bitcoin and Ether to around $65 billion and $27 billion respectively. Additionally, the quantity of the money on the sidelines, and the velocity at which it is moving mean that those values could soar further before the end of 2017.

For many in the banking business, there is again the potential loss of payment and FX revenues due to these new products. The question I get from many of my industry friends is: how do we make up for this loss and take advantage of the potential opportunities that are present?

If ever there were a forum where the answers would appear, it is Sibos in Toronto in mid-October 2017. The challenge for every 'I don't know' is to come away from the conference knowing how to lead.

The answer continues to evolve

The world is changing on multiple fronts and many people are struggling to keep pace with the level of disruption that's taking place – in politics, in the economy, around technology, regulation and even global climate change. We've been talking about disruption in the financial system for a few years now. However, over the past 12 months, the momentum that's been building suggests there is little chance of turning back. Are we at the tipping point yet? I don't think so, but it won't be long before we recognise that new ways of conducting business have become the norm.

When the dust finally settles, there will undoubtedly be widespread declarations that the banking system has been changed forever. Market watchers talk about a potential shake-out of the financial technology sector, about consolidation, acquisition and companies falling by the wayside as some fintechs realise they will struggle to achieve critical mass or scale. However, we may well see a shake-out in the banking industry, as margins continue to be squeezed and some areas of business evaporate forever.

One of the areas that will undoubtedly step into a new paradigm in the coming years is payments, which for many decades were part of the staple diet of banks. There was an assumption, in some quarters, that this jealously-guarded area of business, which often sat deep in the heart of an institution and rarely made headlines, could go on being the exclusive property of banks.

But suddenly, while banks were getting to grips with the financial crisis, financial technology companies – many, incidentally staffed in part by disaffected or defecting bankers – were questioning age-old practices that were no longer providing an optimal service for clients.

The correspondent banking system has been under severe stress for some years. Its multiple stages of intermediation resulted in time delays, uncertain settlement and fees that erode the final amount received by the beneficiary. Payments, which have been electronic for a considerable time, take longer to reach the beneficiary than physical goods. Surely there's something counter-intuitive about that?

Increasingly, people are acknowledging that this system cannot continue, especially as globalisation's march will result in more and more cross-border payments, and financial inclusion efforts will continue to drive volumes upwards at a dramatic rate.

Correspondent banking has also become more expensive for banks and, as they continue to rein in their activities – prompted by de-risking exercises, regulatory requirements and diminishing returns – the opportunities for other ways to execute payments across boundaries are endless.

What role banks play in this shifting landscape is in their own hands. Some banks are focused on withdrawing their services as they contend with internal dysfunctionality and legacy platforms; others are changing priorities but focusing on a more defined client base. The banks that will flourish in this new world are those that successfully partner with fintechs, perhaps build a portfolio of fintechs, and use their new-found impetus as a competitive advantage. We're already seeing one or two banks, who clearly possess the foresight, vision and energy, showing how it can be done but some banks will not be nimble enough to rise to the challenge.

Redefining models

We need banks to redefine their models and set themselves on a course of sensible innovation, rationalisation and focused strategic growth. Banks are our deeply valued clients and we believe that an offering which provides an innovative central connection point that reduces fees, payment stopping-off points, unpredictability around settlement and redundant capital spend, can be very compelling for them. It's more in tune with today's climate and designed to handle growing volumes.

Importantly – and this is the message I will personally take to Sibos 2017 in Toronto – assembling best of breed solutions is no longer a curious idea or classified as take-your-breath-away innovation; they are pragmatic and in many ways, a necessity for a 21st century payment ecosystem.

In short, any concept that enables us to move away from a regime that has been in place for decades, one that was designed for an age of less traffic, more restrictive global business and much lower levels of inclusion, has a strong case for market adoption.

The fact that SWIFT is championing their global payments initiative (gpi) in response to growing unrest is evidence that a lot of people realise that change is afoot. SWIFT gpi is a step in the right direction, but it is more an evolution than a revolution and should be combined with other solutions and partnerships to address the long overdue need for change.

But if banks really think about this, and bearing in mind the new-found importance of transaction banking as a stable, revenue-generating, client-centric sphere of the industry, they will see it as a very logical move to transition payments away from the multi-step correspondent banking, which is both expensive and ineffective for current and evolving business and consumer requirements.

The dialogue is intensifying, the benefits are manifold, for clients and for banks, who will not only relieve themselves of maintaining a costly, unloved and inefficient system, but also because they will be seen as facilitating a better user experience for their customers.

It is time for new models to become an indispensable part of the mainstream. It is an inevitable step that needs to be taken – sooner rather than later.

Hank Uberoi,
CEO of Earthport

WHAT IS THE MAINSTREAM IN BANKING?

Financial IT
Innovations in FinTech

ROBOTIC PROCESS AUTOMATION: THE PRESENT AND FUTURE OF FINANCIAL CRIME COMPLIANCE AND OPERATIONS

How can technology transform investigations and other operational processes that are typically manual, time-consuming, and expensive?

Currently receiving a lot of attention, Robotic Process Automation (RPA) and artificial intelligence are the latest developments that are designed to foster better resource utilization, increased accuracy and productivity, and improved return on investment. Financial crime compliance and related operations are key areas that benefit dramatically from the utilization of an "intelligent automation" approach to save costs and boost effectiveness of compliance-related tasks and actions.

Leading the industry in financial crime and compliance solutions, NICE Actimize is investing heavily in these innovative approaches, further integrating analytics and machine learning competencies into its financial crime and case management solutions. We seek to ensure greater efficiency and cost savings for clients. These processes have proven to be fertile ground for the application of a wide array of automation strategies, ranging from the relatively basic (pre-populating fields in a regulatory filing) to the fairly complex (using machine learning to optimize workflow).

RPA: A growing market

RPA, when integrated with a robust case management platform, is both the present and future of financial crime compliance. Nearly 50 percent of a single financial crime investigator's time is spent on manual tasks, and at least 30 percent of those tasks could be more efficiently handled by robotic process automation.

RPA is one of the fastest growing operational concentrations for the enterprise today, with industry estimates predicting the market for RPA growing to $98.4 billion by 2020, according to Transparency Market Research. Rapidly adopted, it is estimated that about 28 percent of enterprises have already integrated some form of RPA, with at least 50 percent of organizations currently developing strategies to implement RPA for the first time, notes research from the Everest Group.

Clients are very receptive to the notion that they can take greater advantage of their case management platforms, without implementing an entirely new tool, to consolidate internal and external data from multiple information sources into a single system. This reduces the need for analysts to access multiple different applications during their investigations.

A critical strength of this approach is based in the fact that even incremental enhancements to the data-gathering process can add up to huge collective savings of time, freeing up investigators to focus on real risks.

During NICE Actimize's nearly 20-year history of working exclusively with financial crime, risk, and compliance teams, the firm has learned that reducing the effort placed into manual and mundane processes presents an opportunity to provide quick wins in terms of efficiency, productivity, costs, and risk as those areas are prime targets for automation. The NICE automation offerings currently serve around 400 customers and the firm is now bringing the technology to the financial crime and compliance vertical market.

The NICE solution

What distinguishes the NICE solution in the industry is that it permits the use of attended and unattended robots. The attended "robots" are really digital assistants that live in the case manager on analysts' desktops and collaborate with them as needed. These robots can be used on demand – like for copying and pasting or navigating between systems and screens – to help investigators complete their evidence gathering processes and arrive at a decision point faster and more accurately than previously possible. "Unattended" robots work as the investigators digital workforce, working 24/7 behind the scenes without human intervention.

Our company is showing clients that automation already lies within reach, and in some cases it's really a question of optimizing what their investigations systems are already doing. Accomplishing more, with what you already have, is a great way to get comfortable with more advanced forms of automation.

NICE Actimize was recently recognized by Risk.net's Operational Risk Awards, which honors excellence in operational risk management and regulation, with its 2017 Financial Crime Product of the Year accolade.

Joe Friscia,
President of NICE Actimize

Financial IT
Innovations in FinTech

ANRYZE: FUNDING SPEECH RECOGNITION TECHNOLOGY THROUGH AN ICO

Financial IT: Anton, please identify key trends in the voice recognition, augmented reality and voice trading compliance fields.

Anton Gera: Let's start with voice recognition. I would say that the most important trend now is the emergence of different kinds of voice interfaces. We all know about SIRI, Alexa and related applications, however, they all have a very limited access to your files. Overall, they have very limited features and capabilities.

Big companies like Google and IBM understand this. They are now putting huge money into neural networks education. We expect to see the progress in this area very soon. People will be able to do much more than basic things such as ordering pizza through voice commands. They will also be able to create tables and graphics and many other things that are relevant in a business context.

For compliance companies like Anryze, this is good news. For people like us, regulation plus technology equals opportunity. For much of the time since the Global Financial Crisis of 2008, we have been helped by the growth – fully understandable in my view – of regulation. Now, it is technological leaps that are making possible new solutions. RegTech companies like ourselves are working with businesses and regulators, and are contributing to the stable growth in developed economies that we see today.

Financial IT: What is the Unique Selling Proposition (USP) of Anryze?

Anton Gera: In two words, our USP is cost-competitiveness. Unlike most of our rivals, we have developed AI powered analytics which capture specific words and which can analyze the context of the entire block of text.

This means that we can provide speech recognition solutions to call centers and other clients at a fraction of the price charged by major rivals of ours.

This means that we make the technology affordable to a wide range of new users – including private individuals such as students who need to transcribe lectures.

Financial IT: Can you give us a real-life case example of applying your solution in the broker firm or financial institution?

Anton Gera: If a broker uses our system and, while talking to the client, says the word "guarantee" – Anryze's system will flag this word and analyze it. This is where the AI comes into play. If broker said "I guarantee that you will have 20% profit from this deal", we flag it as a compliance situation. We alert the Compliance Manager at the brokerage firm and the actual broker. However, if the broker said "I guarantee that I will call you tomorrow", there is no compliance issue and Anryze would not alert the Compliance Manager, but would send a notification to the actual broker.

Financial IT: How do you use blockchain?

Anton Gera: We are using blockchain for safe transactions between our system and the client. We also store keys to our system in blockchain.

Financial IT: What is the pricing model of Anryze?

About Anton Gera:

Anton Gera is the Co-founder of Anryze. A serial Ukrainian-American entrepreneur, he has been involved with several other speech recognition projects, including Audaster and Protokol. He also co-founded San Francisco's Coliving Club.

Anton Gera: It depends on the type of the client's business and the number of people connected to our system. On average, we are charging brokerage firms US$75 per person per month.

Financial IT: Crowd-selling of Anryze's crypto-tokens started on 12 September. How many contributors did you attract to this Initial Coin Offering (ICO)? What is Anryze's market capitalization? What is the mining process?

Anton Gera: Currently we have 624 contributors (people who invested in our tokens). Also we have already more than 10 business-to-business clients in the pipeline who will be connected to our system by the end of this year.

Each participant of the platform will be able to install the software and receive revenue from the mining (audio decoding). Miners will be able to set working conditions to optimize their income and work automatically.

All token owners will receive 20% from each transaction in the system in proportion to the number of held tokens, and also benefit from the increase in the price of the token.

Revenue from each transaction from client for transcribing minutes will be separated into three components. The first 70% of revenues goes to miners who participated in process of transcribing. The next 20% will go to investors (ICO contributors) and 10% will be our commision.

We think that the global market for speech recognition will grow to US$120 billion in 2020.

Financial IT: Do you plan to compete with world cryptocurrencies in the future?

Anton Gera: Our token (RYZ) will be one of the strongest tokens on the market, because it is backed by money and processing power and time. We won't compete with other crypto-currencies: we will collaborate with them.

Financial IT: What is your forecast for cryptocurrency markets for 2018?

Anton Gera: I would say that the market will grow up to US$250-300 billion in terms of turnover.

Financial IT: Please specify your future business goals.

Anton Gera: Our plan for the next six months is to finish building our platform. We already have created the best speech recognition neural network on the market and now we are working on the back-end for miners. We expect to release a full version in the beginning of the next year. Our long term plans are linked to further developments of neural networks developing. We now have all the tools that we need to help computers to understand people like they understand each other.

Think about that. Very soon, people will not need developers. They will be able to do programming with voice commands.

Instead, there will be a new profession – Architects. These will be the people who adjust neural networks to proper business needs. I discuss this here: *https://medium.com/anryze/no-more-developers-architect-is-a-profession-of-the-future-4d81d687c4c1*

David Pagliaro,
EMEA Head
of State Street Global Exchange℠

BLOCKCHAIN BUZZ

What does blockchain mean for institutions with fiduciary responsibilities?

Technology is driving a phenomenal pace of change in today's financial markets, none more so than blockchain. I'll be frank; it's taken me a while to get my head around blockchain. A type of "distributed ledger" technology, it has risen from relative obscurity — as a system that facilitated bitcoin currency transactions — to being regarded as a potentially game-changing market disruptor, with profound potential implications for the asset management industry. The easiest way to think about it is as a network comprising multiple parties and interactions between those parties – much like a consortium.

The opportunities associated with, and opinions toward blockchain are mixed – and with good reason. While it's an interesting technology (much like artificial intelligence or an Excel Spreadsheet), there has been a lot of hype. There are still a number of technical issues to resolve – governance and confidentiality among them. For instance, how do you ensure you have trusted nodes and end points in the network? And, how do you ensure information remains confidential? Therefore, it's likely there will always be a role for institutions with fiduciary responsibilities to hold and transfer assets with a network. For example, there will still need to be on and off ramps to the blockchain meaning a 'digital custodian' will be needed to enable this 'tokenisation'.

None-the-less, the hype around blockchain has certainly challenged financial institutions to think differently … so I'm going to use this article to elaborate on potential use cases.

Regulatory reporting

But first, I'll be bold and say a total disintermediation of financial institutions as a result of blockchain as we think about it is unlikely. One practical application of blockchain could be to support regulatory reporting. Managers face an increasingly complex regulatory environment with myriad reporting requirements. Aggregating this data from multiple sources and adjusting it for the different formats required by multiple clients and regulators can put pressure on time and resources.

A distributed ledger/ blockchain would theoretically make this regulatory reporting task simpler at a time when firms need to focus harder on differentiating their performance. For example, it could allow asset managers to supply transactional information in a real-time format to both regulators and investors. This could obviate the need for multiple time-specific reports to different entities and agencies. Investors and regulators could simply "mine" the blockchain and monitor the reported information.

Similarly, another novel use case is using blockchain technology to facilitate an Investment Book of Record (IBOR) that offers of a "single source of truth." As such, regulators such as the International Organization of Securities Commissions (IOSCO) have praised distributed ledger technology for its ability to improve market inefficiencies and help emerging-market jurisdictions gain the infrastructure needed to build out their capital markets. At the same time, they note the need to build in safeguards that would underpin investor confidence in this evolving technology.

Efficient sourcing of collateral

Blockchain could also benefit collateral management processes. Regulatory capital requirements, related to Basel III and Solvency II, coupled with mandatory over-the-counter derivatives clearing as prescribed by Dodd-Frank and the European Market Infrastructure Regulation (EMIR), have elevated the importance of high-quality collateral. Financial institutions including fund managers must post margin to central counterparty clearing houses (CCPs) if they are clearing trades, while bilateral OTC derivative transactions now have increased margin requirements following the Basel Committee on Banking Supervision (BCBS) and IOSCO guidelines. Sourcing collateral efficiently is crucial in this new market environment, and blockchain could play a role in enabling this to happen. A centralised database would allow financial institutions to source, identify and manage their collateral more effortlessly.

One of the lesser reported opportunities that could arise from blockchain adoption could be in with illiquid assets like private equity or real estate. Blockchain could allow private equity managers to lower the cost of product creation by "tokenising" illiquid holdings — in effect, substituting them for more liquid "surrogate" equivalents that could be sold to the mass market. Conceptually, this would be similar to a Collateralized Loan Obligation (CLO) where the blockchain replaces the CLO manager. Regulators, no doubt, would need to be reassured that the underlying asset is marketable if demand for tokens dries up.

Another area of debate is the question over public versus private blockchains. Following on from the consortium analogy, fund managers would favour private blockchains. While industry groups such as the Post-Trade Distributed Ledger Group (PTDLG) and Utility Settlement Coin (USC) consortium — and State Street is a participant of both — continue to work toward an industry-wide consensus on blockchain, it is crucial that private blockchains can inter-operate. A failure of private blockchains to inter-operate or adhere to uniform standards could complicate an already crowded market ecosystem. Therefore the best-case scenario may be a public blockchain that is used industry-wide.

Low level of take-up so far

It's important to recognise blockchain is still highly experimental and in the nascent stages of development. Full-scale adoption, the true test of blockchain, requires addressing a number of challenges, including significant areas such as governance, confidentiality, regulation, people and technical scalability/ through put.

For example, what will it take for institutions to adopt a dramatically different trust and security framework? How can blockchain achieve the massive scale necessary to support institutional investment services? What will the regulatory and governance models of the future look like? And what will the implications be for the types of roles and skillsets the industry will require as advances in automation lead to a shift from repetitive tasks to higher-value activities?

Asset managers also need to make sure that the technology can be seamlessly integrated with legacy systems. Failure to do this could result in operational issues or duplication of data.

Disruptive technologies, though often hard to imagine, are the most far-reaching in their impact. While they may start off slowly in the form of experimental innovation, they could ultimately change an industry's fundamental products and services through customisation, collaboration, standardisation or the introduction of alternative applications. As a result, disruptive technologies – such as blockchain –tend to redraw industry's boundaries, enabling new business models and new players to emerge.

Although we're far from realising the full impact of blockchain and other emerging technologies in financial services over the next few years, companies can't count on business as usual.

Financial IT
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BLOCKCHAIN IN REAL LIFE

WHAT WILL BE THE LIKELY IMPACT ON TRANSACTION BANKING AND PAYMENTS?

Blockchain can and will add value to the financial ecosystem.

It can take banks forward in terms of the safer, cheaper and more effective storage of transactions. Settling transactions via a blockchain alters the way in which we do business. It can replace all the functions that currently require a confidential adviser and personal contact with, for example, a bank or lawyer when buying a house. When a transaction takes place, the buyer and seller make the transaction public and the register is then updated.

Banks typically spend a lot time on verifying their 'version of the truth' with those of other banks before carrying out or settling a transaction. With blockchain there's only one source of truth, enabling us to serve clients better, safer, simpler, faster and cheaper.

Start-ups in particular are immersing themselves in the system. In 2015, US$1 billion was invested in bitcoin and blockchain start-ups around the world.

Blockchain can be likened to the other 'foundation technology' that changed the world; the internet. It started with the birth of e-mail in the 1970s, but it took decades before the internet became the basis for many of today's business models. Blockchain started eight years ago as the technology underpinning bitcoin. Now we need new developments, like smart contracts and digital identities, so that blockchain can become the technology standard for the next generation.

Blockchain and payments

Blockchain is the system behind Bitcoin, the first decentralized digital currency, but it can be used for many more types of transactions. Yet, despite its potential, the technology is still in its infancy. In the present, we are seeing an abundance of proof of concepts, but we are yet to see financial services using blockchain as an effective and scalable tool. Over time, blockchain technologies can eliminate the need for intermediaries like banks, governments and stock exchanges. Without the intervention of a supervisory body, transactions can be settled more quickly. The blockchain then serves as the supervisory body, an open system in which all the assets are recorded. In the case of simple transactions, the benefits are limited, but when complex transactions are involved it can make a real difference. In securities dealing, different supervisory authorities are involved during the sale of stocks, meaning a transaction can sometimes take two days. By using a blockchain, the transaction is arranged immediately.

ING and blockchain

For ING, 2016 was about experimentation and getting to know the technology: how it works, how we can use it and what the pitfalls and limitations are. This technology wasn't built for the financial industry so there are constraints. Put another way, it doesn't always cover our requirements. During this test phase, the team worked on 27 proofs of concept in six business areas: payments, trade finance and working capital solutions, financial markets, bank treasury, lending, and compliance and identity.

One, for example, applied blockchain to the 'know-your-customer' (KYC) process, which can be costly and time consuming. Working with 10 other banks, they showed it could simplify KYC so customers only have to submit identity documents once rather than each time they open a new

About Mariana Gomez de la Villa:

Mariana Gomez de la Villa (1979, Mexican nationality) has joined ING in 2015 and is currently the global head of ING's Blockchain program, with overall responsibility for driving research and development of Distributed Ledger Technology as well as capitalizing on its potential in order to unlock mass-scale value.
Under Mariana's leadership, the Blockchain program has delivered over 30 proofs of concept in collaboration with the following business areas: payments, trade finance and working capital solutions, financial markets, post-trade, bank treasury, lending, compliance and identity.

Mariana is also responsible for setting up long-term purpose and vision, including the governance of the program within the organization. Mariana is an active leader in global consortia, outlining the strategy and envisioning market landscapes.
Mariana's accountabilities include the definition of products, services and business models, as well as foresight to business, technology, leadership communities and international stakeholders, including regulators.

account, for example in another country. This increases transparency, security and cost-efficiencies for banks.

In trade finance, too, where processes are largely paper-based, labor intensive and open to fraud, a proof-of-concept was completed by the ING Blockchain Innovation team. It demonstrated that shared ledger technology could reduce operational and compliance costs of trade financing by 10 to 15 percent and increase bank revenues by as much as 15 percent.

Banking industry challenges and opportunities

Globally there are great ambitions for the blockchain but it is still unclear whether substantial amounts of data and transactions can be stored and distributed efficiently in this manner. Large-scale use of the system is currently confined to virtual data. Banks annually process 300 billion transfers and payments worldwide. Blockchain technology has an open source operating system. But because of client confidentiality, a viable use of blockchain for banks is untenable or only partly accessible to third parties. One thing is clear: a lot more innovation is required in order to expand the use of blockchain beyond the Bitcoin.

We expect that banks will see a significant blockchain breakthrough over the next 12 months. The first step is to use the system for internal transactions. Goldman Sachs has already developed its own version of the bitcoin, the SETLCoin, to settle trades involving stocks and bonds. The Nasdaq is also taking its cautious first steps with this technology.

Each solution should deliver several advantages: performance and scalability; acknowledgement of the regulatory and legal framework; privacy and confidentiality. That's why collaboration within businesses and external partners is so important. ING and dozens of other banks have invested US$107 million into R3, a group developing distributed ledger technology for financial companies.

R3 is an enterprise software firm working with over 80 banks, financial institutions, regulators, trade associations, professional services firms and technology companies to collaborate in the field of blockchain technology. In particular, R3 is, investigating the potential use of blockchain for the settlement of complex transactions. Blockchain is a network which makes collaboration a given, and which leverages the power of the network.

For this reason alone, blockchain could prove transformational to global banking operations.

Blockchain technology at a glance

Blockchain is primarily known as the system behind Bitcoin, but it is increasingly being seen as the future of decentralized solutions. A blockchain, a distributed database in which all financial transactions are recorded, does not require an external body to guarantee the confidentiality of the transactions because the register is encrypted and is found on a global computer network where it is constantly updated. Also called distributed ledger technology, blockchain was arguably the fintech "buzzword" of 2016. It enables people to exchange electronic currency in a "peer-to-peer" way, cutting out intermediaries such as central banks, governments or online payment systems.

Dirk Bullmann,
Adviser to the Director General
at the European Central Bank (ECB).

THE DLT REVOLUTION IN EUROPE

What does distributed ledger technology (DLT) mean for the Eurosystem and for the associated market infrastructure?

An old Chinese proverb says "When the winds of change blow, some people build walls and others build windmills". Today, technological innovation has taken our lives into the fast lane, and it is clear that maintaining the status quo or even "building walls" is not an option. The financial sector and the market infrastructures on which it runs are no exception: they too must embrace accelerating change and adapt to emerging technological advances and the changes in user expectations.

Market infrastructures are the backbone of the financial sector. In order to ensure their efficiency and safety, the Eurosystem (the European Central Bank (ECB) and the national central banks of the euro area) acts in three ways: as owner and operator of large-value payment and securities settlement services (TARGET2 and TARGET2-Securities); as overseer, to make sure that market infrastructures operate in line with agreed standards and guidelines; and as a catalyst, to facilitate the industry's work in developing its own initiatives. In these three capacities, the Eurosystem monitors fintech trends and changes in the financial ecosystem and assesses the potential impact of new technologies on market infrastructure.[1]

Among the technological innovations that have been emerging, distributed ledger technology (DLT) is considered to be among the most likely to bring radical change. There has been extensive discussion on whether and when it will trigger an evolution or even revolution in the financial system. From a Eurosystem perspective, it is clear that before a potential use of DLT in the field of market infrastructures can be considered, its efficiency and safety has to be proven to meet the required standards.

Against this background, the ECB is studying DLT and in particular conducting experimental work with different types of DLT to better understand the opportunities and challenges it bears. From today's perspective, we have to conclude that there remain substantial functional, operational, governance and legal aspects which need to be carefully investigated before the use of DLT in Eurosystem market infrastructure services can be considered. However, even if DLT is not yet ready for mass adoption in large-scale services such as TARGET2 and TARGET2-Securities, the ECB continues to explore whether it could bring benefits in the future.[2]

One of the ECB's key areas of DLT work is a joint research project with Bank of Japan, called "Stella". Launched in December 2016, Stella capitalises on the experiences of both institutions as providers of market infrastructure services and is aimed at contributing to the ongoing broader debate about the potential benefits of DLT in the financial sector.

The Bank of Japan and the ECB have published the first results of their joint research, focusing on the implications, in terms of efficiency and safety, of running specific functionalities of their respective payment system services in a DLT environment. The teams replicated some of the liquidity-saving mechanisms of their real-time gross settlement (RTGS) payment systems – BOJ-NET and TARGET2 – in a DLT environment. Subsequently, detailed tests were conducted to assess the behaviour and performance of this specific DLT set-up.[3]

- As scalability is a widely discussed concern in relation to DLT, a series of tests revolved around the question as to whether DLT-based solutions could meet the performance needs of a RTGS system. Here, the joint analysis found that the DLT application could process payment volumes comparable to those currently processed in the RTGS systems in the euro area and Japan. Concretely, taking into account the average traffic of TARGET2 and BOJ-NET (between 10 and 70 transactions per second), processing within the restricted test environment took less than one second on average. However, it was also observed that performance decreased with an increase in traffic.
- The expected trade-off between network size and performance was confirmed during the test series. In other words, the bigger the network and the higher the number of validating nodes, the longer the payment processing time. Likewise, it was concluded that the distance between the nodes has an impact on the processing time, subject to the actual network configuration. More specifically, if the minimum number of nodes required to reach consensus were in close proximity, the impact on performance was lower than for a configuration where nodes were more dispersed.
- It was found that DLT solutions can strengthen resilience and reliability. The test series results indicated the potential of a DLT network to withstand problems such as validating node failures and incorrect data formats. It was observed that, as long as the number of nodes required by the consensus algorithm were operational, system availability was not affected. Tests also confirmed that a validating node could recover irrespective of downtime. Furthermore, it was found that the DLT environment was generally resilient to incorrect data formats, functioning even when a high number of transaction requests with incorrect formats were submitted. However, the chosen DLT set-up included a single certificate authority, which could become a single point of failure that could undermine the benefit of distributed validation.

In a nutshell, the first results of our joint research project with Bank of Japan offer a promising view of the potential use of DLT solutions for payment systems. At the same time, the work was conducted in a specific test set-up and no conclusion can be drawn on the potential use of a DLT solution in a production environment.

The ECB continues to assess the potential merits and risks deriving from new technologies such as DLT from an operational, oversight and catalyst angle. Work is conducted at the ECB, within the Eurosystem and, with a continued focus on gaining hands-on experience with DLT, with the Bank of Japan. We are also working with market participants, for example through a dedicated task force which studies the potential impact of DLT on financial integration in the post-trade sphere.[4] The DLT journey continues.

[1] http://www.ecb.europa.eu/pub/annual/special-features/2016/html/index.en.html
[2] https://www.ecb.europa.eu/press/key/date/2016/html/sp160926.en.html
[3] https://www.ecb.europa.eu/pub/pdf/other/ecb.stella_project_report_september_2017.pdf
[4] http://www.ecb.europa.eu/paym/initiatives/shared/docs/dlt_task_force_mandate.pdf

Financial IT
Innovations in FinTech

DENTACOIN: MEETING THE NEEDS OF DENTISTS AND PATIENTS

Interview with Jeremias Grenzebach

Financial IT: What is Dentacoin?

Jeremias Grenzebach (JG): Dentacoin is the first Blockchain-based concept designed for the global dental industry. The Dentacoin ERC20 token is configured to be used globally by all individuals. Dentacoin aims at improving dental care worldwide and making it affordable through crowd power. Numerous Blockchain-based tools will be developed and implemented.

Financial IT: How did you come up with a startup idea?

Jeremias Grenzebach: At first, we were a small group of Blockchain enthusiasts and a few ambitious dentists, working effectively with digital systems and actively looking for solutions in dental health care.

There are conflicts of interest between dentists and patients. This is because the costs of acquiring and nurturing patients are too high: further, at a global level, only a limited number of people, with certain economic stability, can afford access to high quality dental care.

Going back to the Hippocratic Oath and applying it to today's situation, it is only logical that dentists should be paid to prevent treatment and be encouraged to keep patients healthy, instead of going through extensive, timely and costly payments in future.

Due to the interesting topics of discussions, this private circle we had formed, attracted many people. Within the following months, we soon came up with the idea of bringing Blockchain efficiencies into the dental industry. This is how Dentacoin was born.

Financial IT: Who are your target clients?

Jeremias Grenzebach: Our main target groups are digital-savvy dentists and a younger generation of patients, who have higher responsibility for their health and the health of their families. The latter is our initial target group, which will be the main users of Dentacoin until the middle or end of 2018. After that period we strongly believe that Dentacoin will expand in all directions.

Financial IT: What is your geographical footprint?

Jeremias Grenzebach: Bearing in mind the previous question, the main group of users will likely come from the USA, Australia, the Netherlands, Belgium, Germany and India to start with. Dentacoin is really relevant to everyone in the world.

Financial IT: What are the key differences between Dentacoin and other crypto-currencies?

Jeremias Grenzebach: Dentacoin's strength lies in its real world connection and in the number of daily users. Our unique distribution model is an intelligent way to spread our currency globally, to nearly everyone. Through the highly fragmented dental industry, dentists and patients can receive Dentacoins. The tools are another intelligent distribution model, which will reward people for contributing to the industry through opinion, feedback, forming healthy dental and nutritional habits, etc. Also, the fundamental price per Dentacoin is very low, with the result that it is really affordable to everyone to buy. Dentacoin has also the potential to become one of the global currencies, due to the low initial price and the total supply, which is 5% of the total value of all fiat currencies outstanding.

Financial IT: Please describe your business and commercial model

Jeremias Grenzebach: Dentacoin is based on a Blockchain community model. This means that we are bringing together dentists and their patients and align their interests. The most important factor for the

Jeremias Grenzebach is Co-Founder of and Developer at Dentacoin. He has been involved with peer-to-peer technology for eight years and was an early entrant to the Blockchain scene. He has been a contributor to Ethereum, Waves, ZCash, uPort, Status, imToken and Byteball.

value of this community is the amount of members (users). What is crucial here is the network effect, whereby adding a new participant increases the value of the network for all existing participants. Thus, this growing network becomes a powerful international community, which uses Dentacoin as a currency.

Dentacoin is developing a number of tools to accelerate the distribution process. In fact, the pilot tool is already launched and has increasing interest. The usage of the tools further increases the quality of dental health and stabilizes the income of dentists. This should be a real win-win solution for all.

Financial IT: What is the mining process for Dentacoins?

Jeremias Grenzebach: Dentacoin is already pre-mined. The total supply is 8 trillion, where around 40% are reserved for distribution via our tools (ie earning by participants), 40% are reserved for buying, and the other 20% are reserved for developing of tools, raising awareness, marketing campaigns, the team, collaborators, bounty programs and any unforeseen future expenses.

Financial IT: What is the value? How does Dentacoin affect the price of the dental services?

Jeremias Grenzebach: Dentacoin's mission is to make high quality dental care accessible to anyone. The dental industry is highly fragmented, which makes each dentist an entrepreneur, who is buying material separately. This makes the unit price much higher than what it could cost if all dentists came together and bought materials collectively. One of our future projects – the trading platform - has the potential to bring closer manufacturers and dentists, removing all intermediaries, thus reducing the prices for the patient.

Financial IT: Please summarize the key benefits of using Dentacoin for dentists and patients?

Jeremias Grenzebach: Through Dentacoin, dentists will be able to:

- Have a stable basic income (through rewards and insurance fees in future);
- Create a loyal patient community. This should help them constantly align the service with customer needs: this should help them to achieve a higher level of customer satisfaction, increase the number of recommendations and reduce marketing costs;
- Buy dental materials and equipment (we are already in communication with potential industry partners to integrate Dentacoin as means of payment).

Lastly, Dentacoin is already tradable on many international exchange platforms. It will be available through more after the ICO. This means that dentists, as well as patients and investors, can easily exchange Dentacoin to other currencies if they like.

The key benefits for patients are:

- Becoming an active part in improving the global dental industry; having their voice heard and thus making an impact;
- Establishing of healthy dental care habits;
- Getting rewarded for their contribution to the Foundation's mission with the Dentacoin crypto-currency, which may increase in value over time
- Being able to pay for dental treatment, dental care products and dental insurance with Dentacoin.

Financial IT: It is already patently obvious that crypto-currencies can fall, as well as rise, in value. How might a fall in the value of Dentacoin – or, indeed, many crypto-currencies at the same time – affect your business model?

Jeremias Grenzebach: We are confident that our distribution model will allow us to keep full control over the speed of our business expansion. As a result, we should be able to avoid the negative effects of crypto-currency speculation.

Financial IT: Do you believe that Dentacoin will be mainstream in the future?

Jeremias Grenzebach: Yes, we strongly believe this. More importantly, our community and supporters believe that, too. It is incredible to see how many people reach out every day to our team members and offer help and give ideas. This shows true support.

On a more business note: dentistry is really relevant to everyone. Dentacoin was originally conceived as an industry internal payment method. However, more people are interested in using Dentacoin outside of our platforms, which means that Dentacoin will very soon become a mainstream means of payment.

Financial IT
Innovations in FinTech

DACXI: BUILDING THE WORLD'S FIRST CRYPTO-INVESTOR COMMUNITY

Interview with Tim Baxter

Financial IT: Tim, Dacxi will shortly be raising funds through a global initial coin offering (ICO). What is Dacxi, exactly?

Tim Baxter: The Dacxi is fundamentally a global investor community targeted at empowering and protecting retail investors. We believe they will be the next big group entering the crypto-coin world and drive the next growth wave to 2020.

Financial IT: So what's different between these investors and the people currently in crypto-coin market?

Tim Baxter: The global crypto-coin market has been developed first by the crypto-pioneers and then by Asian day traders who created the boom this year. They either were sophisticated in tech or in speculating in new currencies.

And now that they have shown the potential of the market, lots of people, literally hundreds of millions of people, would love to get involved, if only with 'casino' money. Their challenge is having the confidence to get involved – which they only get through a clear community environment. Giving them education, analysis, information, etc. That's the Dacxi.

Financial IT: If your community is free to join, how will you make money?

Tim Baxter: We will monetize our community through a global crypto-exchange. In fact, we are building a global network of crypto-currency exchanges. They will be able to handle dozens of crypto-currencies and crypto-tokens. Investors will be able to trade crypto-coins and crypto-tokens for fiat currencies. The central exchange within the network will be in Singapore.

Financial IT: There seem to be lots of crypto-exchanges around: what's so special about yours?

Tim Baxter: You are right. There are many exchanges in the world. And a lot more coming. Yet none of them support this new retail investor community. Most of them are overly 'technical' because they are designed to support margin traders, or possibly institutions. They are not for the common man or woman. Therefore, by providing the support they need, we are confident that the retail investors will use the exchange.

Our exchange will be a world-class 'Allcoin' exchange using the latest security technology provided by our technology partner who is Europe's leading provider.

Financial IT: Will the exchanges be regulated?

Tim Baxter: Absolutely. For our audience, trust is everything – so we have applied for full securities licensing in Singapore. As it happens, we only really need to be regulated for one of four types of crypto-tokens. The Monetary Authority of Singapore (MAS) is a very forward thinking organisation. That regulator sees that an effective ecosystem will deliver a tidal wave of new Fintech startups. So, it is prepared to be innovative in solutions.

Further, we have the leading compliance legal firm overseeing how our exchange operates. Our system of independent analysis, coin checks and compliance is widely considered as the only

credible system that will empower the retail investor community and protect them from scams and weak coins/ICOs.

Financial IT: Why do you call them 'crypto-coins'?

Tim Baxter: This is a classic example of the confusion that slows the speed the public will be slow to join this market. If you talk to the public, maybe 1% have any idea of 'crypto' until you say 'Bitcoin' when lots more will show some recognition.

The problem then is if you start with a reference point of Bitcoin, they think 'crypto' are currencies. Thus 'crypto' is assumed to mean 'crypto-currency'. Yet less than 1% of crypto-coins have a use case of 'currency'. The other 99% are crypto-tokens. They have a value, but they aren't money. They don't act as a long-term store of value, a unit of account or, critically, a medium of exchange.

The problem, then, is that the public think 'tokens' are worthless, and not worth investing in. In contrast, 'crypto-coins' means value.

Financial IT: Why won't people just use Youtube to get educated?

Tim Baxter *[Laughing]:* Have you ever looked on Youtube on crypto? It is the perfect example of what a nightmare it is for the average person to get educated and informed. Youtube education has no structure. It's either too technical or focused on trading delivered by amateurs.

The public, even bearing in mind our initial focus on relatively sophisticated people, whether they are young professionals or mature investors, need a complete package of support. They need much more than a few videos or a website platform. We are experts in building global communities. People need a complete package of mobile accessed simple education, deep analysis, community recommendations driving by a massive program of live webinars, meetings, events and workshops.

Financial IT: And you will do this globally?

Tim Baxter: Yes, we will be in 30 languages within three months, covering over 100 countries globally. Our exchange alone will be in 10 languages within three months. The next growth wave will be global, taking crypto to every country in the world. We will then support them whether they may be – Japan, Kenya, Poland or Argentina.

Financial IT: What numbers are you expecting?

Tim Baxter: We are confident of building a 10 million-strong community by 2020. Our community could be a lot larger given our orientation towards Asia and the demand in that part of the world. I have never met someone who didn't want to join. We predict that global investor numbers will grow from 20-30 million today to 150-200 million in this period.

Financial IT: So what is your DAC coin?

Tim Baxter: Our DAC coin will be used to drive the community into critical mass. It is the world's first community incentive coin. We have already raised enough money to launch everything, so our coin investment will be spent on marketing and community development. The coin itself will be used to motivate recruitment, referrals and to reward our 'dacxi dragons'. Our 'dragons' are members who provide expert analysis.

The DAC coin is the store of value for our community, with 70% of exchange profits, and also a flood of value from our patented convertibility system for ICOs will eliminates investor risk. That alone is expected to add $1 billion or so to the value of the coin. It will also be the only coin in the world with a marketing organization of hundreds of thousands and a post-ICO marketing budget of millions.

Financial IT: Why do you think the Dacxi will succeed?

Tim Baxter: We are confident because the public needs an investor community and we are experts at community building. We are not tech kids with a dream of Blockchain revolution or rookies hoping to get lucky playing on a global stage. Our team is full world experts, leading compliance lawyers and top business people. And, our timing is perfect.

We will be more than the 'facebook' of the crypto-world where the world connects around crypto-investing. As we succeed, more people will join this industry and drive the growth helping everyone.

Tim Baxter is Chief Operating Officer (COO) of Dacxi. Tim worked as a Chartered Accountant with global firm PriceWaterhouseCoopers (PWC) before becoming a senior executive with global logistics group DHL. He has overseen DHL's operations in many countries across the Asia-Pacific region, including Singapore, Indonesia, Vietnam and New Zealand.

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Financial IT
Innovations in FinTech

THE FUTURE OF BLOCKCHAIN IN BANKING

Philippe Meyer,
Managing Director of Avaloq Innovation

Blockchain has useful applications in various industries, with banks proving increasingly interested in this technology. So far, the only generalized example of this has been bitcoin. Although the famous crypto-currency has been an undeniable success, blockchain is not a magic wand that will solve every bank's problems. They shouldn't expect it to revolutionize the whole industry overnight. While some stakeholders seem to have unrealistically high expectations, future developments will take time.

Bitcoin: Significant Interest

Bitcoin is one of the first examples of blockchain technology that banks have shown interest in. Admittedly, this virtual currency remains somewhat mistrusted – in part due to perceptions of it as a tax evasion tool. Despite this, more and more clients are asking their private bankers about the crypto-currency. Some clients have large bitcoin assets and wish to consolidate these with their regular portfolios. This pressure will push banks to adopt platforms enabling clients to visualize those assets directly while allowing customers with bitcoin assets to rely on their trusted banks instead of specialized bitcoin players who may not be firmly established.

Know Your Customer: A Major Issue

Know Your Customer (KYC), the regulatory process used to verify clients' profiles, is also set to have a huge impact on the industry. This regulation makes attracting new customers increasingly demanding and complex for the bank, but also for customers, who have to complete seemingly endless forms.

In the future, it's possible some KYC information will be factored and pooled between banks. "Regtech" start-ups are already offering products of this kind and customers have already shown interest in such solutions.

Blockchain shares and distributes information and encryption in ways that make it a particularly powerful solution for KYC obligations. Blockchain can be deployed on private networks, so cryptography can be implemented to shield sensitive information.

It's impossible to set up a distributed KYC service without sharing some sensitive information. However, there is a potentially viable business model for scenarios when a customer completes a KYC process with Bank A before deciding to do business with Bank B. In this case, the customer could use a certificate from Bank A to prove to Bank B he has already completed a KYC process. Bank B would probably pay a fee to Bank A, but this would be small compared to the cost reduction.

In this model, the first bank would be informed its client has started a relationship with another provider. At a time where multi-banking is common, at least in the private banking world, this would not be an issue.

Payments Revolution

Blockchain is also a tool that can ease cross-border payments. For example, Ripple has set up a blockchain network connecting banks. The typical use case is a cross-border transaction between two SMEs. The standard correspondent banking scheme is quite inefficient; it takes five days to transfer the money, while transaction fees soon add up. With the standard scheme there is also a risk the intermediary bank will default, leaving transactions unmatched.

Blockchain offers a more efficient solution. In the case of Ripple, an internal currency has been created that is quoted by authorized market makers. Payment is completed in minutes and doesn't depend on message exchange. As the internal cur-

rency is not a true digital currency, each bank still needs money to guarantee the transactions. Despite this small drawback, this solution is really promising.

Payments in Europe will be disrupted by the European Union's second Payments Services Directive (PSD2). Among other things this will enable clients to manage all the accounts they hold with different banks using a single interface. This revolution on the front-office side will massively impact the banking landscape. It could be accompanied by a similar revolution in the back-office. Blockchain technology would introduce payment systems that work using transactions instead of messages, making a clearing mechanism unnecessary.

Beyond Payments

Blockchain technology will also be used to set up "smart contracts" which execute automatically according to predetermined criteria.

In this instance, the advantages of blockchain can monitor the life cycle of financial products more complex than simple payments, including options and other derivative instruments. Due to their derivative nature, these products, whether they are OTC or listed, require both counterparties to monitor market conditions and track when barriers are hit.

Cash flows are generated when certain market conditions are reached. Tracking several hundred or thousands of products consumes significant resources and requires substantial reconciliation work. It would be more effective to automate the process using smart contracts to schedule these cash flows. Also, this solution combines the flexibility of the OTC world with the transparency demanded by regulators.

Speed of Adoption

The speed at which blockchain technology is adopted will be determined by differences in the structure of the banking market from country to country. Progress will be faster in smaller or non-existent ecosystems. If we look at geography, a country like Australia could adopt blockchain technologies faster than others as the banking system is dominated by four very large institutions. The same could be said of Switzerland, where integration is already quite strong thanks to the SIX centralized payment system. However, the presence of such an effective centralized tool will make it more difficult to migrate to an alternative.

However, while the securities chain will benefit from this technology, adoption could take between 10 to 15 years due to the lack of ambition to transform the industry.

The more attractive the use case in terms of potential cost reduction, the higher adoption reluctance is likely to be. This is because there will be more intermediaries, all with something to lose.

In the coming months, we can expect to see the first blockchain initiatives reach production stage. These potentially competing initiatives will pose integration problems to the industry. That said, these challenges will not necessarily be more difficult than those we face already in securities, for example.

Despite the lack of standardisation of blockchain solutions, this technology is here to stay; it allows all assets to be truly digitized.

The Avaloq group is a technology-driven financial services provider for wealth management, universal and retail banks. Avaloq serves more than 155 financial institutions around the world.

Whitman E. Knapp,
Chairman of GTBInsights LLC

BLOCKCHAIN AND LEDGER PROTECTION

You've heard it all before. Will blockchain end fiat currency, the banking system, or both? Let us instead give a more useful examination of the means by which this technology can support the functions of the transaction banking ecosystem. An American Banker conference, entitled Digital Currencies + the Blockchain (28 July 2015 in New York), reflects the positive evolution of the discussion about blockchain as a transformational ledger.

Some members of the transaction banking world have puzzled out the fundamentals of blockchain, though there remains a general lack of awareness. This article is a layman's guide for those in the transaction banking world who, for whatever reason, have not familiarized themselves with the latest developments in the discussion.

To appreciate the full dimensions of this potential transformation, it is useful to review the basics of the transaction banking ecosystem. Transaction banking, at its most elementary, is the provision of payments, trade and securities services. In this discussion, the focus will be on the payments function, with the caveat that virtually every trade or security transaction – all of them other pillars of transaction banking – start and/or end with a payment.

The da Vinci code

The current transaction banking ecosystem dates back centuries, to Italy and the Italian merchant class of the Renaissance. Goods and services were sold from one party to another with those sales requiring payment from buyer to seller. Rather than moving physical currency or precious metals for payment, as in the past, the merchants established offices in the main centers of trade and commerce, and moved money by entering debits and credits on double entry ledgers which were also a new invention of the time. Goods and services moved in the physical world.

Payments moved on books. Transaction banking today shows remarkably little change from the original 14th century design. One of the few changes was produced by the introduction of the telex after the Second World War. This fundamental disruption of the transaction banking operating model created multiple product lines where there had been only one. Prior to the realization that money could be moved by telex faster than the underlying details of the transaction (be it a simple payment, trade or securities transaction), there had been one business line, commonly known as the international business. But with the new technology, separate payments, trade and securities businesses were created. These three branches grew in size until recently, when some of the major transaction banks have tried to reintegrate them, either as one unit, or a minimum central management structure.

Not so SWIFT to begin with

The entrance of SWIFT onto the transaction banking scene was, in fact, not the disrupter many have claimed. The first SWIFT messages exchanged in 1977 helped organize, codify, speed up and secure a business made increasingly difficult to manage under growing volumes of transactions.

Citibank attempted to bring order to telex based payments with its Mardi system in the 1960s, though an industry wide approach was needed to standardize operational practices. SWIFT provided that standard, and went on to become the backbone of the transaction banking ecosystem.

With the aim of speeding up and controlling risk in the movement of payments, transaction banking also created a host of intermediary entities to facilitate the movement of money. A series of clearing houses (CCPs), depositories (CDPs), and low and high value payments systems emerged. (Familiar names from the US in this ecosystem include CHIPS, The Fed Wire, ACH, DTCC; from Europe: CHAPS, FPS, CLS, TARGET2, STEP2, and Euroclear.)

Today there are over 200 entities which make up the transaction banking ecosystem. While these organizations were set up to

provide greater safety, it is increasingly evident that they generate unique risks of their own and complicate the efficient conduct of transaction banking functions, not to mention adding significant costs. Similarly, the introduction of the internet in the 1990s served to speed up the processing of transactions, but did not fundamentally change the operating model.

With the creation of this vastly complex system of intermediaries, it is not surprising that an equally complex network of regulators developed to safeguard the public interests. The events which brought the world banking system close to collapse in 2008 only intensified the political demand for more regulation and hence the increased administration and cost burden for transaction banking. The dimensions of this burden are seen in stark detail when looking at the US regulatory landscape with dozens of federal and state regulators to whom the banks are accountable.

Enter the young turks

Given this degree of complexity, with multiple hubs and spokes creating significant points of operational friction and cost, it is understandable that transaction banking was a tempting target for those who wanted to disrupt the system and start a new system based on new technology; a fresh approach to organizing what is a basically simple system but which had, over time, become overly complex.

The catalyst for a fresh approach was supplied on 3 January, 2009 in a white paper published under the name of Satoshi Nakamoto entitled 'Bitcoin: A Peer-to-Peer Electronic Cash System.'[1]

Whoever the author may have been, the white paper sent a title wave of irreversible change throughout transaction banking. The Bitcoin was "commercialized" by the work of what Michael Crain outlines in his Observer article "anti-establishment... young companies backed by brilliant cryptographers, complex programming and security protocols and varying degrees of anti-establishment fervour."[2] With some of the early players suggesting "We've got to work within the

system to destroy the system" the initial and often heated discussion focused on Bitcoin and the role it would play in transforming transaction banking as we know it. But, as the discussion became more measured and evolved into a broader discussion of blockchain technology and distributed ledgers, it became increasingly clear that those who started out to "destroy" the transaction banking ecosystem were, in fact, the very players who are on the verge of saving it.

Blockchain reaction

There is a growing consensus that transaction banking is at the edge of a sea change which will surpass our current ability to predict or define. What are the basic elements of blockchain technology which is producing this sea change?

What does blockchain technology offer transaction banking?

[1] https://bitcoin.org/bitcoin.pdf
[2] http://observer.com/2015/02/the-race-to- replace-bitcoin/

The answer to this question is complex at best. There are a multitude of products and services being created and offered under the umbrella of this vast new area of technology. The technology not only impacts the payments segment of transaction banking but the other two pillars – trade and securities as well. It also important to note other diverse areas of potential in the non-monetary space such as KYC, notary services, smart contracts, digital IDs for smart property, mortgages and asset ownership in the supply chain.

For simplicity's sake, however, the focus here is only on the wholesale payment infrastructure – the payment rails – of the transaction banking ecosystem, and the answers are reduced to their simplest, most basic dimensions. Blockchain is a decentralized ledger which keeps track of all the transactions taking place across a peer-to-peer networks, on which it operates and facilitates an internet of value exchange. This may be an open source public ledger blockchain as in the case of the Bitcoin, to which any entity may have access, or a private network blockchain to which access is controlled and which supports the offerings of Ethereum, Hyperledger or the more well-known Ripple Labs.

The Bitcoin blockchain is referred to as "permissionless;" the Ripple blockchain is referred to as "permissioned." (The taxonomy around the blockchain ecosystem is still in its formative stages; as such, purists will suggest that Ripple does not operate on a true blockchain. For the moment the term blockchain will be used in its most inclusive sense and as the generic term for distributed ledger.) In the public, permissionless Bitcoin blockchain model, transactions are added in blocks to the public ledger, and are authenticated and confirmed by proof of work algorithms with digital signature cryptography for validation of contract. In private, permissioned blockchains, a consensus algorithm is used instead of a proof of work to confirm the addition of transactions to the blockchain.

Side chains

With the expediential increase in interest in blockchain technology, there is concern that the Bitcoin blockchain may not be sufficiently scalable to meet the increase the volume of transactions required to support other payment offerings, distinct from the Bitcoin, as well as non-monetary offerings. To meet this need, developers have put forward the concept of "side chains" which are pegged to the Bitcoin blockchain as the solution. These would be attached to but separate from the Bitcoin blockchain and circumvent the concern that the Bitcoin blockchain does not have the capacity to support new payment or other developments.[3]

How does blockchain technology benefit transaction banking? The technology allows the transfer of payments from peer-to-peer across the Internet without the intervention of a central intermediary. Buyers and sellers, payers and payees interact directly with each other with no need for verification of a trusted third party. Identity and transaction detail are encrypted by public-key cryptography, and a transaction record is created on a publicly accessible chain in the case of Bitcoin or a private node as in the case of Ripple. Intermediaries such as CHIPS, The Fed, Target 2, and Step 2, described earlier are no longer required, significantly reducing costs and increasing the speed of transactions. The reduction of operating expense, in the area of US$15bn to $20bn a year according to some experts[4], and the lowering of capital requirements given the reduction in transaction latency, has the potential to create significant new financial dynamics in transaction banking.

Compliance, audit, risk and legal

Despite its substantial promise, the new technology is incredibly complex and will take years rather than months to fully sort out. At the moment there are more questions than answers to fundamental issues surrounding it. The questions include:

- Which version of the blockchain will predominate? The permissionless or the permissioned blockchain? Or will both be used depending on the underlying type of transaction.
- Therefore, will the blockchain be a public or private distributed ledger?
- Inherent in this discussion is whether authentication of transactions in a chain will be by the proof of work or consensus method?
- What is the legal underpinning of the transactions? How will title to the assets transferred over a distributed ledger be proved?
- Is the current Bitcoin blockchain capable of absorbing the anticipated volume of transactions in its present construct? Will side chains prove a viable option for increasing capacity?
- Can wholesale and retail payments be linked in one seamless system? Can mobile payments be incorporated to provide the first/last mile connection to the consumer?
- As the ecosystem evolves and frees itself rom the friction injected by the old hub and spoke, central counterparty system, what will be the role of the existing lynch pins of that system, i.e. correspondent banks, clearing houses, securities depositories etc.?
- What relationship will develop between the traditional financial institutions, and the aspiring FinTech companies heavily backed by capital from Silicon Valley and other venture capital sources?
- What changes in regulation and regulatory structure are going to be needed to ensure the security of transactions and guard against fraud?
- Are we ready to make another change in nomenclature, moving from blockchain to distributed ledger as the central underlying feature of the new transaction banking ecosystem?

Answers to these questions will shape the future of transaction banking and will form the agenda for multiple conferences, workshops and articles over the coming months, indeed years. However, at the end of the day, the success in commercializing the new technology will be determined by the fundamental question of how well "Blockchain meets CARL." CARL is compliance, audit, risk and legal and represents the real world within which all players in this space must function. These are the controlling foundations of the transaction banking ecosystem, and therefore the foundations – rules of the road – which any individual, group of individuals, or company, no matter how bright and talented, must learn to work if they are to succeed in changing that world.[4] Success will only be achieved by learning how to operate effectively with CARL.

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[3] www.coindesk.com/scaling-bitcoin-day-1-constructive-debate-shines
[4] See also David Meynell's and Gary Collyer's blog 'What is Blockchain technology?' at www.tfreview.com/node/12724

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Financial IT
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NEW ATTITUDES IN A PSD2 WORLD

PSD2 is a great way to progress the thinking behind the original PSD requirement and free consumers (business or retail) from what some would consider the shackles of incumbent bank monopolies. But, what does that really mean for all of us?

The noble aim of the European Union's second Payments Services Directive (PSD2) is to enable consumers and corporates to benefit from increased choice from other providers... as long as we agree to give banks access to our financial data.

The question is, how can the incumbent banks and the new payment service providers (PSPs) truly gain value?

For the PSPs, the answer is clear and simple: value comes from a wider customer base, allowing them to showcase their latest intuitive access portals to a (much) larger number of clients.

For banks, the answer is not quite as simple. In essence, there are two options – a defensive strategy and an offensive strategy.

For banks that elect to take the defensive approach, PSD2 is purely an exercise in compliance and meeting the minimum terms of service allowing a PSP access to initiate a payment using banks' client data, while ensuring that the GDPR (General Data Protection Regulation) is adhered to. From May 2018, GDPR will be embedded within local legal jurisdictions. Banks will also have to consider the potential implications of their tax structure and business model.

If they take an offensive approach, banks need to find new ways of monetizing the outcomes of PSD2. It is predicted that there will be a 37% decline in card transactions as a direct outcome of the introduction of new players. Factor in that an anticipated 20% of online transactions are to be made by mobile devices in 2018, and there will be an onslaught of data requests into the banks. These will likely come from consumers on the train to or from work, as opposed to the traditional timings and methods.

Despite the timing challenges, this provides a plethora of opportunities for banks to leverage artificial intelligence (AI) and predictive learning tools to augment their solutions. Within the first year of PSD2 implementation, this will open up the ability to model cross-border requirements – based on existing and new entrant PSPs. Other factors that will need to be accounted for include political events such as Brexit , elections of new governments and the introduction of new policies. This will evolve rapidly into the provision additional Value Added Services, to include Order Management and predictive FX requirements, for example. The lines will rapidly start to blur between corporate expectations and those of the retail market.

In order to address the agility of the market shaped by adoption rates, all the key players on both sides will have to be nimble – enabling them to capitalise on new, and possibly unforeseen, opportunities and ensuring they are seen as innovators rather than bumbling relics of the previous world.

APIs and cultural change

The requirement to be agile is not a new concept, but it's all too frequently perceived as a destination rather than a continuous journey. The advent of API acceptance and adoption by the banking community in the past 18 months will accelerate this. A change in culture is paramount to ensure continual momentum. Only then the industry will truly see the benefits to all parties within an open banking community.

FINASTRA

Matt Williamson,
Global Head, Payments and
Cash Management at Finastra

At the centre of achieving success generating retention or market share growth will be the effective use and development of API libraries. This will be the crux that enables all parties to tap into new revenue streams swiftly and adeptly. Today's banks still regularly operate in silos with no cross-over or effective communications. While developing APIs which allow them to connect with third parties in the outside world, they should incorporate an additional focus on using that investment to burst through the silos and create (as best they can) a fully integrated, communicative back office. By doing this, they will achieve their own internal value add, which in turn can be delivered back to their client base. One rule of banking never changes: the more you know about your client, the better service and tailor made products you can offer.

New mindsets

We cannot underestimate the challenges faced and, despite initial discomfort, banks must adopt a mindset that allows them to make the most of the 'new order'. PSD2 must be viewed as an opportunity, rather than a mere compliance issue.

Over the past two years, we've witnessed a growing trend towards Fintech collaboration. Previously, everything was developed in-house or procured and heavily customized to put the identity stamp of the bank onto it. The focus has now changed to how you can add value: I (the bank) have the client base; you (the Fintech) have the intuitive technology. Let's partner and drive change instead of having it thrust upon us.

Building upon this collaborative relationship, banks and new entrants alike can leverage the breadth and depth of expertise that spans multiple geographies, and can ease the burden, allowing the banks especially to de-risk new opportunities.

If the regulators' vision of PSD2 and open banking comes to fruition, the possibilities are boundless and likely to evolve rapidly for both the consumer and those participating in the chain:

- The growing interest and applicable use cases in the Internet of Things (IoT) and artificial intelligence (AI) will shape bulk buying of FX, fueling real-time trade/spreads and catering to both manual and automated trading.
- Order management will allow complete initiation services (SME and Corporate), Transformation from any format and Straight Through Processing.
- Cash and liquidity services will include balance reporting (for the ASIP), sweeping/pooling services, forecasting and account reconciliation.
- Information messaging services will include request for pay, addressing and aliases and remittance information.

What's more, we are yet to factor in what will influence and trigger payment initiation behaviours. With 3D printing and drone-based services becoming more commonplace and acceptable as means of accessing purchases, we will see their utilization grow even further from smaller one-off items to larger ones.

For example, GE has announced that it is experimenting with printing jet engine parts, with subsequent plans to form entire engines. Kmart has patented a floating warehouse in the sky to take advantage of drone-based services: the future implications are epic.

Do consumers really care about PSD2? Unless there are clear reasons for them to break the mould, adding to already sizable options such as PayPal, Apple Pay, Pingit, and the traditional channels that are already available to corporate clients, possibly not. It is for all of us within the industry to demonstrate the value and opportunity.

A lack of initial public understanding didn't prevent Steve Jobs or Elon Musk from articulating and achieving their visions. It won't stop the financial services industry's forward-thinkers either.

Formed in 2017 by the combination of two global Fintech leaders, D+H and Misys, Finastra builds and deploy innovative, mission-critical technology on its open Fusion software architecture and cloud ecosystem. Its approach stimulates co-operation and co-creation to transform financial institutions – delivering better experiences for its own customers and the customers' customers. Finastra brings deep expertise and unrivaled breadth and depth of pre-integrated solutions spanning retail banking, transaction banking, lending, and treasury and capital markets. With a global footprint and the broadest set of financial software solutions available on the market Finastra combines $2.1 billion in revenues, 10,000 employees and over 9,000 customers, including 48 of the top 50 banks globally.

Financial IT
Innovations in FinTech

Cesar J. Richardson,
VP Strands Americas

OPEN FOR BUSINESS OR CLOSED TO OPPORTUNITY?

What is Open Banking?

Open is the new shut, across all sectors: innovation, disruption, competition and general progress depend on it, and in an age of increasing transparency and unlimited access to data, the financial sector was in desperate need of an overhaul.

Banking, long the untouchable, ever-traditional and invincible establishment, is being forced to modernize and reinvent itself. Whether the banks like it or not, the reality is that legislations due to come into force by mid-2018 both in Europe and elsewhere, are seeing to it that old habits die hard in this traditional sector.

Open Banking will monitor how banking data is consumed and shared, for the benefit of customers, who will have greater choice of financial products, for the bank, who will understand their customers better and be more efficient in their offerings, and for the wider financial sector, which will become more innovative and susceptible to disruption on every level. The result: a better banking experience for all parties involved.

Banks, who have historically had a firm grip on their data, may find this a hard pill to swallow, potentially finding their vision clouded by being forced into relinquishing control, but the advantages are numerous if they can look beyond the mere formalities.

What's clear is that without a fixed open banking strategy in place, the bank will be hard pushed to see the advantages.

What does it mean for banks and their customers?

Pau Velando, General Manager of Strands believes that "open banking is going to be the single most important source of data enrichment to train intelligent artificial agents. This is what will transform the user experience completely".

Intelligence is fuelled by data, so freer data directly translates as more efficient and personalized services, and as such, a better customer experience overall.

This is the bigger picture, an upgrade on the data banks have had at their disposal thus far, often working with a small percentage of the customers' overall financial information, and a chance to be the financial 'life partner' of their users going forward.

Banks who can see beyond the immediate upheaval that new legislation will bring to the sector, will find that customers are much more likely to feel secure in using services from a trusted bank, than a new market entrant. Far from losing out by adapting to this new system, banks will discover new revenue models and business opportunities to be explored, and the ability to offer the best, most convenient service (own or third party) to their clients at any given time, establishing new third party collaboration models.

For customers, having access to and control over their own banking data will mean increased options for choosing and using financial products, and better ways to manage their finances. The end-user also gains access to third-party services and products as a direct result of this growing competition, and as industry players reinvent themselves and their offering.

For challengers in industry, having access to open bank data, and clear, secure ways to integrate it with shared customer data, will mean they can quickly develop new, or better, products and services. For banks, being able to make their interactions with customers smoother and simpler will help them find efficiencies, improve customer service and deepen their customer base.

With this change, banks will be faced with one main concern: security, and how opening the floodgates, to all intents and purposes, will affect the stronghold they have traditionally had over their customers' sensitive data.

This is where new, increased security comes into play, in the shape of SCA, or Strong Customer Authentication. Now, depending on the transaction, one or two levels of security 'filters' will be required, and all payments and access to user data initiated by third parties will be closely monitored and controlled.

SCA is essentially the implementation of identification mechanisms which allow banks to refuse third parties entry to customer data where necessary, and trace all third-party transactions at all times.

Many banks believe that third-party data aggregators put their customers' bank accounts at unnecessary risk and their servers under unpredictable and uncontrollable strain. In the US, great lengths have been taken by the Consumer Financial Protection Bureau to understand just where the benefits and risks lie for consumers.

Open Banking: connecting digital banking users with merchants.

The current reality is that internet giants, the likes of Google, Amazon and Facebook are patiently waiting in the wings until they are able to get their hands on banking's lunch money, and banks have little say in the matter. Banks have a

unique, but short window of opportunity now to plan their attack, but should be aware that, if nothing is done to reposition themselves, they pose little in the way of competition for technological companies of these dimensions.

Autonomous, relevant and accurate interactions at scale represent a great challenge when it comes to data availability in the current context of banks: most lack the critical mass needed to compete.

The Open Banking paradigm offers a means for banks to do just this, by enabling new highly personalised, accurate, relevant and on-time relationship models without human intervention.

Technology, such as that offered by Fintech companies, can provide banks with the necessary tools to help customers manage their lives, not just their finances, more effectively.

How will global legislations such as PSD2 and Dodd Frank standardize this new kind of banking?

PSD2 and the General Data Protection Regulation (GDPR) in Europe and Dodd Frank in the US, are two example of legislations being put in place to provide a solution to the changing global banking sector. Regulations will differ from country to country, in keeping with individual circumstances, but one thing all countries have in common is that as the sector grows and modernizes, the corresponding rules need to follow suit.

Europe's PSD2 regulation is proof that the European Banking Authority (EBA) is taking open access to data very seriously, and this regulation, to be fully functioning during 2018, is standardizing the way data is exchanged for good.

Dodd Frank, brought into US legislation under Obama in 2010 in the wake of the economic recession of 2007-2008, and as a means of avoiding financial crises of the scale of the Wall Street crash of 1929, is now coming under scrutiny by the business-minded Trump administration, who deems it to have had negative effects on the economy and needs to be scaled back with new proposals for the Financial Choice Act currently on the table.

Measures are being taken to facilitate this important step in banking innovation: The US Center for Financial Services Innovation (CFSI), in collaboration with industry experts, has established several principles to ease the transition into a fully transparent, inclusive and modern data-sharing ecosystem.

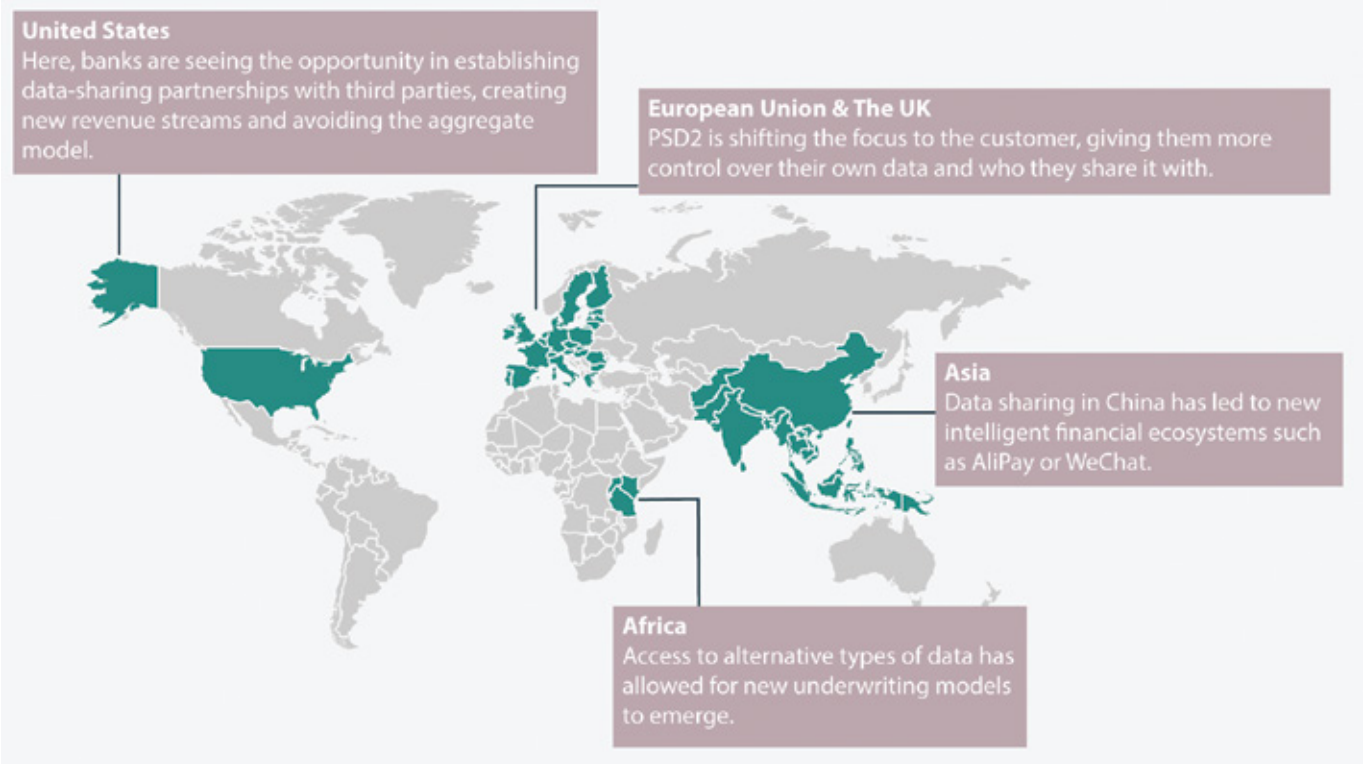
Whether or not to comply is not the question at hand at this stage of the proceedings. Transparency is the rule, not the exception, access is inevitable and the smart move is to buckle-up and prepare for a rocky, yet rewarding ride.

STRANDS

Strands is recognized by the financial industry as "The Fintech Partner for Banks", serving more than 600 bank implementations with a hundred million customers in thirty-six countries, categorizing and enriching ninety-four million banking transactions daily.

The company was founded in 2004 in Oregon (US) and Barcelona (Spain), initially developing personalization and recommendation solutions for the music industry. Apple acquired these early solutions together with a portfolio of 32 patents, allowing the company to focus its innovation efforts on the research and development of financial technologies.

Strands is a fintech pioneer, with the award-winning solution for Personal Financial Management (PFM), launched in 2008 in the United States and Europe. Strands Finance Suite today includes a portfolio of products that share a common foundation based on Big Data Processing, Artificial Intelligence, Machine Learning, Open API, and best-in-class Customer Experience.



PROVIDING A FRICTIONLESS AND SECURE CUSTOMER JOURNEY IN PSD2

About Varun Maggon:

Varun is Product Manager at CustomerXPs and plays a key role in the evolution of the company's category leading real-time banking anti-fraud product Clari5.
He has broad experience in Fintech and Telecom in the areas of Strategic Planning, Business Development, Delivery and Product Management.
Varun is a B.Tech. and an IIM MBA.

European leaders have long identified that the future of the financial services lies in the co-existence of the conventional banks with emerging fintech. However, to reach to that stage, security of the customer data is the major challenge. Despite industry efforts, fraudulent transaction levels are on the rise in Europe.

Payments Services Directive 2 (PSD2) introduces the concept of Strong Customer Authentication (SCA) to provide transaction security. However, this can put Payment Service Providers (PSP) in a Catch 22 situation by having them tread the thin line between transaction security and customer experience.

Let's see how Risk Based Authentication (RBA) as mandated in the PSD2 guidelines can play the balancing act without compromising on security and ease of use.

What is PSD2?

PSD2 applies to payment services in the European Union (EU) and is framed by European Banking Association (EBA). The directive focuses on all electronic payments including card present and card not present transactions. PSD2 provides data and technology driven directive to regulate the previously unregulated third-party payment service providers.

In doing so, it increases competition with the aim of making payments and account access more innovative, transparent, efficient, and secure for the consumers.

What Are The Key Takeaways From PSD2?

Without going into the nitty-gritties of the guidelines, here's a summary of the major FAQs.

Introduction of New Players: PSD2 defines the role of Third Party Providers (TPPs) and their services. There are two types of TPPs viz. Payment Initiation Service Providers (PISPs) may initiate a payment transaction directly from the customer's bank account and Account Information Service Providers (AISPs) consolidate the customer's account and transaction details from multiple banks in one portal.

Transparent Access to Accounts: PSD2 formulates the rules for access to the customer's accounts (XS2A). Banks are mandated to open their core banking infrastructure via APIs to licensed TPPs. This will allow TPPs to provide account information services and enable payment initiation services.

Strong Customer Authentication: SCA is an authentication process that shall include two or more authentication factors viz. knowledge, possession, inheritance (biometrics). PSD2 mandates the use of SCA whenever the customer initiates any electronic payment transaction, whether to make a payment or access bank/TPP services.

What is Exactly is Strong Customer Authentication?

PSD2 introduces strict security requirements for the initiation and processing of electronic payment transactions and access to accounts. One RTS in PSD2 is focused on a definition of Strong Customer Authentication (SCA), including when and how a PSP must ensure it is their customer making a payment or request for account management.

In a nutshell, SCA is a customer authentication process that must include at least two out of the three authentication factor types:

- Knowledge – something only the customer knows (e.g. password or PIN)
- Possession – something only the customer possesses (e.g. the card, authentication code generating device, token)
- Inherence – something the user is (e.g. the use of a fingerprint or voice recognition)

As per the draft technical standard published by the EBA, SCA has to be applied in 3 cases.

- Online access to payment accounts e.g. banks's e-banking or via an AISP
- Initiation of online payment transactions including card present and card not present transactions
- Any action through a remote channel that may imply a risk of payment fraud, e.g. pin change

PSD2 brings into the jurisdiction, one legged transactions, i.e. those payment transactions where the payer's or the recipient's PSP is based outside of the EU. So, SCA has to be performed for these transactions as well.

The impact of PSD2 therefore is more global instead of localized only to Eurozone, as anticipated earlier.

How Does SCA Impact Customer Experience?

Customers have been prioritizing experience over security, but this seems to be slowly changing with regulators driving greater security.

The impact of the requirements for Secure Customer Authentication is set to radically change the customer experience and journey. Initiating a 2-factor authentication for every transaction or account access has a serious impact on customer experience.

'One click checkouts' will be thing of the past and many fear it will stifle innovation in the Payments space rather than promote it.

When Will It Be Implemented?

However, EBA has allayed fears of banks, merchants, e-commerce companies, etc. by including clauses for exemptions from Strong Customer Authentication.

The exemptions for SCA are debated, because of the need to find a balance between security, fraud reduction, innovation, competition, user-friendliness and accessibility.

In the EBA guidelines, the situations where a PSP is not obliged to use SCA include when the customer is:

- Making a contactless payment at point of sale
- Accessing their payment account data again (subject to time limit)
- Paying for transport and parking
- Making a low-value payment
- Paying a "trusted beneficiary"
- Making a recurring transaction for the same amount
- Moving money to another of their account(s) at the same PSP
- Making a low-risk, remote payment and the PSP has low levels of fraud loss

Evidently, these clauses correspond to either fixed restricted usage rules or prior authenticated parties. But the final case provides PSPs with a certain level of control for transaction, provided they perform Transaction Risk Analysis.

It lays down the foundation of Risk-based authentication of the payment transactions thus playing crucial role in reducing customer friction.

How Does Risk-based Authentication Eliminate The Payment Journey Friction?

Risk-based authentication is not a new concept by the EBA. It has been around for quite some time now. However, this time the concept has emerged as an unambiguous and fair solution for security vs convenience trade-off.

The EBA has mandated PSPs to put in place transaction monitoring mechanisms in order to enable them for detecting unauthorized or fraudulent payment transactions.

PSPs are expected to ensure that the transaction monitoring mechanisms takes into account, at a minimum, certain risk-based factors on a real-time basis:

- Lists of compromised or stolen authentication elements
- Amount of each payment transaction
- Known fraud scenarios in the provision of payment services
- Signs of malware infection in any sessions of the authentication procedure

What this means for the PSPs is that, using these transaction monitoring systems, they are able to record these parameters and further use them to validate incoming payment transactions from a fraud perspective.

PSPs can use these parameters to risk rate the payment transactions and in turn use it as a criterion to avoid Strong Customer Authentication.

As per PSD2 guidelines, PSPs on a minimum shall -

- Calculate a risk score based on the transaction monitoring parameters discussed above
- Identify any abnormal behavioral pattern from the payer
- Look for unusual information about the payer's device/software
- Check for malware within the authentication procedure
- Look out for known fraud scenarios
- Check for abnormal locations for the payer
- Verify whether the payee is in a high-risk location

If there is a fraud indication in any of these checks, then that shall call for either strong customer authentication for the transaction or rejection of the transaction. The final outcome desired is that by using these checks, PSPs shall be able to keep their fraud rates below the reference fraud rates set by EBA (see table 1) for remote payment transactions.

By achieving this, they will be able to accept and process payment transactions without applying further SCA and as a result be able to provide better customer experience.

Fraud Rate Reporting

The PSPs shall notify the national centralized authorities about their intention of using exemptions from SCA basis the lower fraud rates. The minimum requirement is reporting detailed loss rates by exemption every 90 days.

These statistics must be broken down across all payment types, remote card payments and remote credit transfers, including where no exemption is used. If for a PSP, the monitored fraud rates are above the EUR 100 reference rates for 2 consecutive quarters, then that PSP shall cease the usage of exemption from SCA.

However, if the monitored fraud rates fall below the threshold for a consecutive 90 days, they are free to exempt future transactions from SCA.

PSPs also must have real-time fraud management, so that being able to know the trends in fraud rates on a daily basis will allow them to tune authentication policies.

Else, how will the PSP know the fraud rates at the time of reporting? Also, Daily Fraud Rate is a better measure of fraud rate compared to the Daily Average Fraud Rate, which is computed at the end of the quarter.

Way Forward

The need of the hour for PSPs is to balance security and customer experience. As evident from the EBA guidelines, there's no single way to combat the problem. We need a multi-pronged strategy.

PSPs must adopt a hybrid approach to fraud detection and prevention, which should include a rules based system, behavior profiling of customers/devices/users, link analysis between entities, and machine learning based predictive risk scoring.

These features can help reduce fraud at the bank while also reducing false positives which in-turn will help PSPs to provide a superior customer experience.

Table 1. Reference fraud rates asset by EBA

Transaction Value	Reference Fraud Rate (% by value of total tranzactions that are fraudulent over previous 90 days))	
	Remote Card Based Payments	Credit Transfers
EUR 500	0.01%	0.005%
EUR 200	0.06%	0.01%
EUR 100	0.13%	0.015%

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UTILISING BANKING DATA TO CREATE NEW REVENUE STREAMS IN A POST-PSD2 WORLD

Grab the data opportunity with both hands, with CLOs for instance...

The banking sector is changing beyond all recognition. Traditional banks face competition from Fintechs, app developers, internet giants including Google, Amazon, Facebook and Apple and mobile payment providers such as Baidu, Alibaba and Tencent. Imminent PSD2 legislation mandating open access to data, and other open banking initiatives, will accelerate this revolution. If they don't act soon, banks stand to lose control over their customer interactions and, as a result, new revenue streams that they should be capitalizing on.

The customer relationship has already moved from being a human dialogue in a bank's branch into the digital space, presenting a major threat to revenue from up- and cross-selling. When customers start accessing their banking information through a third party platform such as a personal financial management app, these opportunities will recede further still.

What many banks may not realise, however, is that the means to stay competitive in a post-PSD2 world is at their fingertips. With intelligent use of their own customer data and by partnering closely with merchants, they can create new revenue streams. With enriched consumer financial data, banks can build products that provide an innovative, personalised end-user experience, while transforming the business results of merchant and retailer clients alike.

Take card-linked offers to the next level

Card-linked offers (CLOs) are an example of a product which could unlock significant new revenue streams. CLOs enable consumers to receive discounts or loyalty points at merchant partners when they use a bank payment card that is linked to a discount or loyalty offer. In turn, merchants get access to customer segments that will likely to be interested in their services and products, and banks can turn what are traditionally costly loyalty programs into a new source of revenue (and improve digital engagement with their customers at the same time).

The CLO market is very developed in the United States. Some 70% of US companies used CLOs last year, and over 51% of all consumers in the US used a CLO, according to the 2016 Annual CardLinx Card-linking Industry Survey of leading payment card issuers, merchants, payment processors and networks, digital publishers and retailers[1]. In Europe, however, banks are only just really starting to catch on to the opportunity.

Part of this issue lies in the fact that most CLOs are still quite generic, shared indiscriminately with all customers – "use your payment card to purchase from certain retailer and get 10% off", for example. If banks can leverage their consumer data to better understand user spending habits and browsing patterns to make CLOs more personalized and targeted, CLOs could be set to make the transition from being a source of peripheral income for banks towards being a fresh revenue stream.

To demonstrate the power of CLOs: a fast-food restaurant chain tapped into bank data (using a Meniga CLO programme) to identify a segment of customers that were big spenders at nearby similar fast-food restaurants. The data suggested that the chain run a 50%-off marketing campaign CLO direct to the newsfeed of the online or mobile banking platforms of the target customers. Around 60% of customers who redeemed the offer subsequently

[1] http://www.ecb.europa.eu/pub/annual/special-features/2016/html/index.en.html

About Bragi Fjalldal:

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became long-term customers who continue to spend money at the restaurant at an average of twice the rate that they did during the original campaign.

This is a great example of an effective CLO campaign which delivers a deep, relevant discount to bank customers and an attractive return on investment for the merchant, while the bank takes commission on redeemed offers.

In general, successful CLOs should feature:

- High-quality data and segmentations algorithms – highly accurate mapping between merchants and transactions and proven segmentation algorithms are key to delivering effective targeting
- Seamless integration with everyday banking – target consumers should see CLOs as part of their everyday mobile and web banking
- Flexibility – campaigns should be varied to target new or existing customers with different offer features, ranging from percentage discounts to geo-notification
- Automated campaign management – with defined campaign return on investment (ROI)

Package up your data and sell it

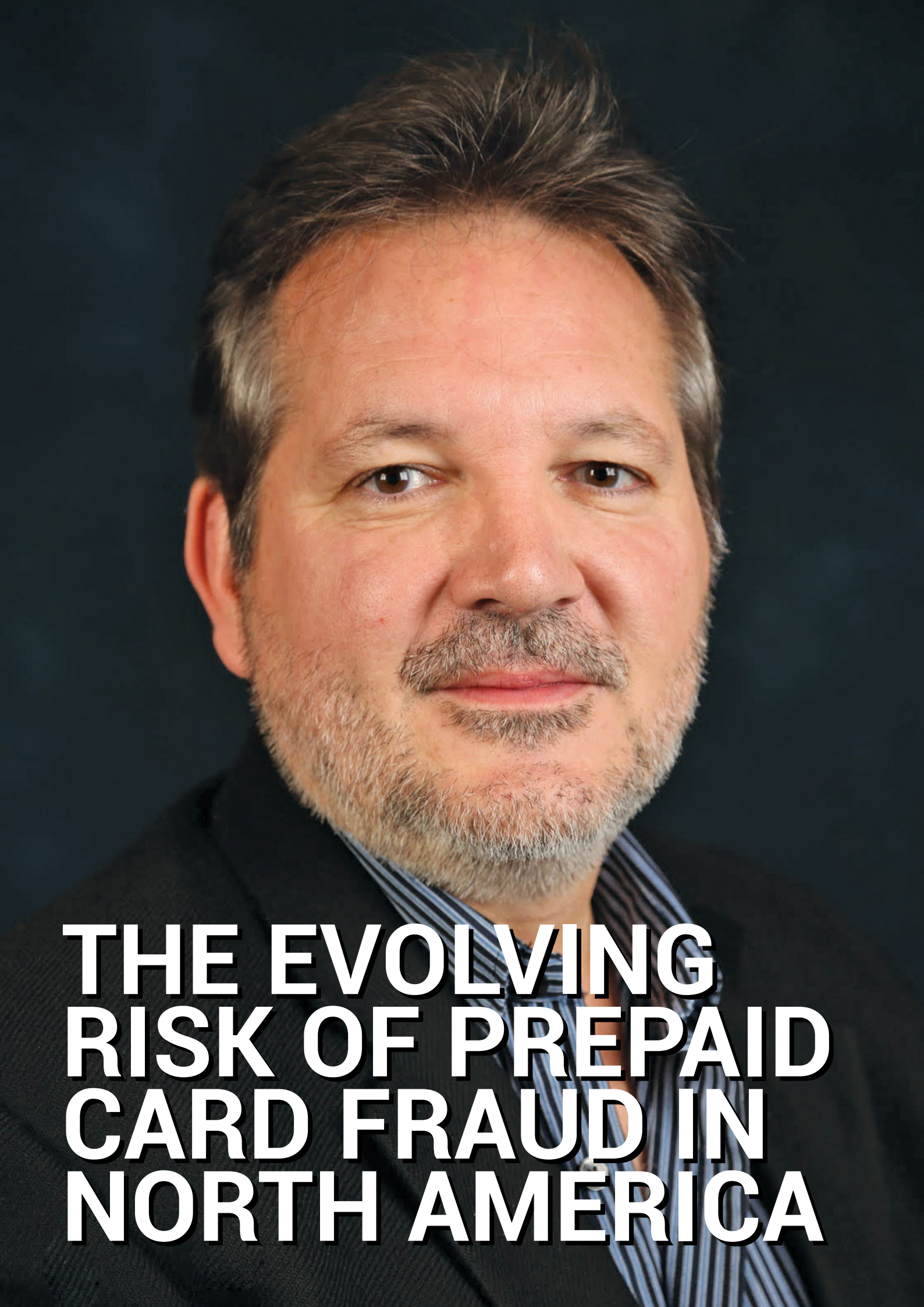
Banks are also in a position to build new revenue streams from aggregated consumer data. Data on its own provides no valuable insight, however, once customer data has been consolidated and enriched, it can be packaged up and shared with merchants to help them better inform their marketing and strategic decisions.

Banks can create live market intelligence reports from aggregated, enriched transaction data. Merchants can track market share development week-by-week, even down to store location, as well as measures such as frequency and average ticket or spend size. For example, banks can sell reports to merchants that provide a clear picture of how the business is competing against the competition's sales in a defined geographical area. Using consumer data that shows exactly where people are spending their money on groceries, a grocery store could establish beyond doubt that they have a 20% market share in their town. When a marketing campaign is completed, the grocery store can see hard evidence as to whether market share has gone up or down in response to the campaign.

Sophisticated categorisation engines can be used to process millions of transactions a day – interpreting transaction codes and text pattern matching to apply a category to each transaction, such as 'groceries', 'restaurants' or 'savings'. Within banking apps, users can be invited to create their own categorizations and to edit the categorizations suggested, so that such engines can continue to learn and improve. Add into the mix external data sources, such as merchant directory data or social networking data, and banks can build profiles based on values, interests and lifestyle choices, making it possible to identify and target groups of prospects with similar profiles.

Switch on the data revenue stream

The introduction of PSD2 is imminent and, while some banks are making strides to prepare for the upheaval of open banking and renewed competition they will face from tech giants, there is more work to be done to support them and help them leverage the power of their own customer data. The consolidation and enrichment of such data to personalize the individual banking experience will help the banks keep the edge. This will not only help banks drive more meaningful engagement with customers, but will also help unlock new revenue streams in 2018 and beyond.



THE EVOLVING RISK OF PREPAID CARD FRAUD IN NORTH AMERICA

What are the key issues?

Fraud is never far from the headlines – and understandably so; it is an issue that affects everyone from an international corporate scale down to the individual, no one is immune. In an age where sharing and collecting data is the norm, fraudsters have endless avenues from which to attack and access more than just card numbers. In this modern world, high-street merchants, e-commerce sites and even utility providers ask for much more information than just your payment details, whether to personalize your customer journey, cross and upsell or just streamline processes – so when data breaches inevitably occur the wealth of information available is more detrimental than a few dollars lost.

Big data has been heralded by The Economist as the world's most valuable resource – even more valuable than oil and keeping this information secure is becoming increasingly difficult. Over recent years we've seen numerous high profile attacks on multi-billion international businesses from Target to the repeated attacks on Yahoo, resulting in over a billion user details being compromised. The most current example to make the headlines is the Equifax data breach which was due to vulnerable computer code.

Fraud is no longer a couple of hackers sitting together on their laptops, or a sole employee stealing card details from a customer, it is a lucrative criminal business. While initiatives, legislation and regulations are being rolled out to combat fraud, like with any changes to our environment, these criminal enterprises are evolving, adapting and finding different avenues from which to exploit new revenues. Alongside this, even some of the more 'traditional' methods of financial duplicity are evolving – one of which is the misuse of prepaid cards.

Each year, Americans load billions of dollars onto prepaid cards for a wide variety of purposes, from bill payments, buying groceries and filling their cars with gas to remittances or as salary cards. The diverse use of this card type whether out of necessity or convenience is an undeniable attraction. Nevertheless, tracking prepaid cards after their initial setup is difficult, and this has attracted the attention of fraudsters.

Firstly, it must be understood that there are different types of prepaid card, primarily – reloadable or non-reloadable. Non-reloadable card fraud is minor, as the denominations on them are usually preloaded or set at the cashier, such as $20 gift cards, and personal details are rarely required. This is not the case with reloadable cards, and when data breaches occur, this personal data is available to those that want it enough.

Reloadable prepaid cards are often used by fraud conscious consumers when making payments online, or while on holiday to protect against access to full bank accounts. However, no payment method is completely secure against attacks: while fraudsters once used to persuade vulnerable people to send money through wire services, they are now convincing them to purchase a prepaid card or put money onto an illicitly obtained prepaid card. This is achieved through a variety of methods, such as telephone scams where store clerks are convinced the criminal is testing their reloadable prepaid terminal, or something as brazen as replacing packaged cards instore with fake cards. The fraudster can then redeem the funds on the card, use it in stores or withdraw from an ATM with little-to-no traceability.

To add insult to injury, prepaid fraud often leads to the consumers themselves being liable to pay any penalties incurred by scams. This is due to the liability shift around prepaid cards, as these cards are often purchased rather than set up directly through a bank

It's not just the consumer that is at risk of prepaid fraud too – criminals are also attacking prepaid card systems, not just the cards themselves.

At the end of 2013, JP Morgan Chase saw 465,000 of its prepaid cash card holders' details compromised, while earlier in the year processors containing a prepaid database for two Middle Eastern banks were breached by a ring of cybercriminals, resulting in the withdrawal of $45 million from multiple ATMs over a ten-hour period. While these are extreme cases, it is proof that, while vulnerabilities remain, prepaid cards are under attack.

There is nothing revolutionary about what needs to be done to ensure that prepaid fraud is limited as effectively as possible. Some steps, such as ensuring card management platforms have the most innovative, future-proof fraud detection and response capabilities, supplemented by rigorous testing and predictive analytics, cover all card types.

However, we also need to do more to secure prepaid cards themselves: starting with the same care and attention in product design as standard debit and credit cards. While convenience, understandably, has been the main priority with prepaid up until this point, the recent rise in fraud associated with these cards means it's time to reassess this. Federal regulators made a start last year, outlining rules that will limit losses for prepaid card users.

As identity theft provides a basis for a large proportion of prepaid fraud – particularly with the growing number of reloadable cards –traditional and online banking channels need to be secured and customers need to be educated on the risks they potentially face and how to avoid them. The issue with prepaid fraud isn't that is growing – it is that it is evolving. Financial institutions need to recognise this and take preventative measures.

About Anthony Genovese:

Anthony Genovese is Vice President Consulting Services at Compass Plus - an international provider of retail banking and electronic payments software to processors and financial institutions. He has over 30 years' experience in the payments industry, and is responsible for further establishing Compass Plus' presence in North America by cultivating relationships with prospective clients and assisting with solution design based on the needs of North American financial institutions.

Leveraging over 50 years of experience in the development of leading technologies for building large-scale automated systems, amongst which more than 25 are in electronic payments, Compass Plus provides high-tech, business oriented, unique applications amalgamated into a comprehensive product suite for financial institutions, including retail banks and payment processors across the globe. As a mid-size company, Compass Plus can offer a product range to rival any long-standing industry leader, without compromising the quality of customer relationships and getting lost in a maze of corporate bureaucracy.

RISK IDENT: FIGHTING FRAUD

An interview with Roberto Valerio

Financial IT: What are the major fraud threats hitting online businesses in 2017?

Roberto Valerio: Fraud is continually strengthening and evolving. Even though it suffers repeated blows, it's clear that the threat to online businesses has never been greater. Significantly, as fraud rises, so does consumer knowledge of the issue, with headlines like: "You are now 20 times more likely to be robbed while at your computer than held up in the street". So if a business does not have sufficient fraud prevention strategies in place to protect consumer data, then not only are revenues on the line, but so is the business' reputation.

At Risk Ident, we keep a constant watch on all of the latest trends and tactics that fraudsters are using to bend the law in return for a pay day. In 2017, we've seen huge spikes in identity theft which has triggered a sharp spike in account takeover fraud attempts. The continued rise of mCommerce has also seen smartphones targeted more than ever, while the ticketing industry is becoming ever more blighted by bots.

Financial IT: Who are the fraudsters and why do they do it?

Roberto Valerio: There are three general categories of fraudsters within e-commerce and telecoms that you should separate:

- People with a bad credit history or no money: They want to buy a premium product that they cannot afford; leather jackets, handbags, electronics, Apple products etc.
- Petty criminals: They use stolen credentials and payment information to obtain goods. These goods are being resold at eBay etc.
- Organized criminals: These people do it for a living. Some of them use their proceeds to finance other high-margin crimes, e.g. selling drugs or even weapons. They are responsible for high losses, sometimes adding up to hundreds of thousands of pounds in a single case (including hundreds of orders). The criminal gangs are sometimes quite structured and they can work cross-border (cases end up being handled by Europol.)

So, their intentions are quite different. The first two cases are mainly driven by greed and opportunism. The latter case is based on real and dangerous criminal motives.

Financial IT: Should consumers be worried about having their identity stolen online?

Roberto Valerio: Essentially, yes. Cifas (the UK's leading fraud prevention organization) recently reported that identity theft is reaching "epidemic levels", with a record number of cases reported in this first half of the year alone. It's no longer enough to just shred letters from the bank before binning them; more than four in five cases are now committed online. Fraudsters will gather information on social media, the dark web and remotely hacked computers. Consumers should also be vigilant against fraudsters calling them directly to extract vital information or phishing attacks via email.

There's also a tendency to think that fraud is something that only happens to the wealthy or vulnerable. People in their 30s and 40s are now more likely to be targeted than pensioners, as there tends to be more personal information about them stored online. The age group 21 to 30 saw the sharpest rise in H1 2017, according to Cifas.

Financial IT: What's the danger of ID theft to online businesses?

Roberto Valerio: Once identity data has been stolen, fraudsters can create new accounts on ecommerce sites and begin ordering merchandise, often to be sold-off at a profit. However, the real danger comes when the fraudster uses the personal information to hijack existing accounts, masquerading as a legitimate user.

About Roberto Valerio:

Roberto Valerio is one of the foremost experts on the rise of AI in combating fraud and founder of RISK IDENT, Europe's leading provider of new intelligent anti-fraud software. Roberto sits on the European Advisory Board of the Merchant Risk Council and is a regular speaker on Europe's anti-fraud conference circuit.

Poor password security (such as repeating passwords across accounts, or using simple words like 'password') plays a significant role here, but fraudsters can also use personal information to break security questions.

Another tactic is to target the victim's email account, which often acts as the anchor to their entire online life, and from there break into multiple accounts across a vast range of online businesses.

Existing accounts contain everything from addresses to birthdays to saved payment information. These details alone constitute everything one would need for online fraud. But the key here is that a genuine account which has been hijacked also offers fraudsters a significant advantage; trustworthiness.

Online businesses typically place much more trust in existing customers with years of good experience behind them, than they do with new customer accounts. This gives fraudsters space in which to hide.

Financial IT: Are there any suspicious signs of a hijacked account that online businesses can keep an eye out for?

Roberto Valerio: Fraudsters work hard to stay invisible for as long as possible, but it is possible to spot them early and prevent irreparable damage. Indicators of account takeover can include: an unusual numbers of failed login attempts, a password change followed by unusual customer behaviour, purchasing an unusually expensive item or a high volume of goods, login attempts from different devices and places or switching to an older browser / operating system.

However, many of these indicators can also be innocent customer behaviours and here online businesses must be careful of false alarms. False positives not only harm immediate revenues, but also damage customer relationships and subsequently, brand reputations.

Financial IT: What's the threat-level for mCommerce? And what can be done to counter it?

Roberto Valerio: mCommerce is important opportunity for online businesses, set to be worth $250bn by 2020, but a new channel for us is also a new channel for fraudsters. I spoke on this topic recently at the Fraud Management for Banks event in Germany. Today, fraudsters will take over portable devices in attempts to avoid detection or triggering fraud alerts. Fortunately, by combining device fingerprinting with a local security SDK added to the targeted smartphone App it is possible to track and halt their activities.

Financial IT: What is the precise role of Machine Learning and Artificial Intelligence in fighting fraud?

Roberto Valerio: Machine learning technology, based on developing computer programs, recognises patterns and regularities in datasets, and is then able to learn from each transaction and a wealth of historical data. In this way, it can continually create new models and constantly evolve algorithms that help ecommerce businesses stay a step ahead of the fraudsters.

While fraudsters seek to conceal their locations, mask their identities and make their fraudulent transactions look unsuspicious, machine learning technology finds patterns, calculates risks and halts illicit activities – in real-time.

However, AI alone is not enough; fraud managers are indispensable in the process. Domain experts, with years of experience fighting fraud, know their fraud problems best and can never be replaced by a machine. Only by combining the two entities will businesses see the best results. Fraud managers constantly feed their knowledge on the context and causes of fraud into the machine, allowing the system to evolve continually. Businesses can therefore scale their fraud protection system, allowing it to grow and evolve exponentially.

concardis
your payment expert

NAVIGATING THROUGH THE CHANGING LANDSCAPE OF THE PAYMENTS INDUSTRY

What are the prospects and pitfalls?

On 21 September 2017, financial insiders reported that the Swiss stock exchange operator SIX hired J.P. Morgan to evaluate options for a divestment of its payment services unit – a lucrative business worth up to CHF2 billion. Only one month earlier, the SIX Group had purchased the acquiring and terminal business from Aduno, another heavyweight on the Swiss payments market. In April, the Dutch e-commerce specialist and tech unicorn Adyen gained a banking license, effectively broadening its product portfolio. And in January, the financial investors Advent International and Bain Capital Private Equity had acquired the leading German payments service provider Concardis in order to build a strong payment platform for German-speaking Europe.

These are just some of the most recent examples of expansions, mergers and acquisitions in the payments industry – a market that had been stagnant for years but which is now quickly becoming one of the most dynamic fields in the financial sector. Driving this development is the increasing digitalization, which changes the whole payments ecosystem and the respective market framework: consumers vary their purchase behavior, relying more and more on mobile devices and convenient online shopping opportunities while merchants explore different channels for sales and distribution. At the same time, technological advances enable digital business models, permanently shifting business perspectives and allowing new competitors to enter the payments market.

Welcome, PSD2

Pan-European competition in the payments sector is set to gain further momentum on 13 January 2018, when the second Payment Services Directive (PSD2) will take effect in all EU countries. It is shaking up the industry already, and with good reason: The directive will open up payments and mandating data access and increase transparency, encouraging the development of innovative payment products. As the banking sector will have to incorporate new application programming interfaces, direct payments between bank accounts and new account information and aggregation services will certainly emerge. Fintechs will be eager to take advantage of the PSD2 provisions, which in turn will force the banking sector to restructure and reassess their payment services and put forth new players in the payments industry.

In light of these developments, key payment service providers are bringing themselves into position to navigate through the changing landscape of the industry. They strive to gain a competitive advantage as three factors become more and more important for the strategic business development in the payments sector: speed, technical competence in a broad product portfolio and operating at scale.

The need for speed

Speed is becoming a crucial factor because the market needs smart solutions for the increasing demands of the growing e- and m-commerce – fast. The slow systems and limited positioning in the payment value chain of the past can no longer fulfil the requirements of a modern integrated payments infrastructure. As the stationary and virtual points of sale are merging in order to provide the customer with a seamless shopping experience, merchants need to manage their sales and transactions across all distributive channels over one single omni-channel payments platform. Convenient and easy access to transaction data, real-time monitoring and extensive reporting options are therefore becoming just as important as intelligent data management systems and value-added services through smart data analytics.

With a vibrant Fintech scene wanting to take over market shares, established players therefore have to strengthen their production and innovation capabilities and assert quick go-to-market-strategies in order to prevail in a more and more competitive payments sector. In this regard, we at Concardis learned a lot from our cooperation with start-ups such as orderbird, the number one iPad POS system for the gastronomic sector. For us, a fast-paced working culture marked by individual responsibility and a hands-on mentality is just as important as the careful assessment of market needs and direct feedback from our customers, and we are in the process to

About Marcus W. Mosen

Marcus W. Mosen is the Chief Executive Officer at Concardis, in charge of sales, product and customer development and the main driving force behind the strategic business development of this German payment service provider. He is also a member of the Administrative Board of the Association for the Promotion of MasterCard Activities in Germany e.V. and a member of the supervisory board of orderbird AG, in which Concardis is a strategic shareholder. With more than 18 years' experience in the industry, Marcus W. Mosen is one of Germany's leading experts on the development of the payment sector.
Prior to joining Concardis in 2013, Marcus W. Mosen furthered the strategic business development at Ogone, the easycash Holding GmbH and First Data International. He had started his career in the payments industry as Senior Vice President Merchant Processing at Gesellschaft für Zahlungssysteme mbH (GZS) after working in the telecommunications sector at vebacom GmbH and gaining experience at the Treuhandanstalt, a privatisation agency for East German industry.

change and develop our company accordingly. For example, we established interdisciplinary teams and competence centres in essential business areas such as e-commerce to take the lead in technological development.

Cutting-edge solutions and a wide product portfolio will ensure that we meet customer expectations even in times of rapid technological changes. As the payments sector becomes more diverse and complex, merchants increasingly rely on one-stop payment providers in order to have only one key contact for all matters regarding cashless payments. Therefore, payment providers not only have to handle the entire acquiring and processing of payments but also need to develop payment solutions for the stationary POS, e- and m-commerce and offer additional services such as gift or loyalty programs.

Concardis, for example, invested in and launched a brand-new payments platform, which will facilitate the fusion of all payment channels onto one platform and brings together various payment methods into a single and uniform structure. It greatly reduces complexity via a RESTful API and simplifies the interfaces with downstream service providers. The architecture of the payments platform allows the soon-to-be available connection to our own POS operations. From this point on, users will enter a world of true omni-channel sales. In addition, our new In-App Payment Library, a mobile software development kit specifically for native apps (iOS and Android), ensures the seamless integration of individual payment methods into mobile applications. Consumers no longer notice a difference between an app and the underlying payments system – digital start-ups such as the Munich-based hotel app hotelbird.com are already using this new mobile payments solution.

Size matters

When developing such new products and services, size matters. Established players like Concardis with a significant merchant portfolio and a broad value chain have the ability to use scale effects. Thus, we are able to provide products and services at competitive terms and prices. More importantly, we can leverage our customer base for an effective rollout and market penetration. For that reason, providers of new payment options often cooperate with larger payment service providers to gain market access and get critical exposure quickly. Otherwise, market entry barriers can prove too high to become successful.

For example, Alipay, the world's largest payment and lifestyle platform run by the Chinese Ant Financial Services Group, started a strategic partnership with Concardis in 2016 in order to enter the German payments market. With more than 116,000 customers and a market share of 40 percent in the German acquiring sector, Concardis proved to be the ideal partner for advancing the Chinese payments solution.

Thus, payment service providers with a wide customer base and broad value chain have a strategic advantage over smaller, specialized payments companies and fintechs which struggle to establish themselves on the market long-term.

Therefore, we can expect further drive for market consolidation as the key players try to expand their reach and product portfolio. The changing payments landscape promises opportunities for both rationalisation and growth, which is why the payments industry will remain a truly dynamic business sector for the foreseeable future.

Concardis is the leading full-service payment provider in German-speaking Europe. Concardis acts as a consultant and point of contact for some 116,000 customers with more than 470,000 connected terminals and is active in 118 countries. The company ensures seamless processes at the point of sale with its fast and convenient payment processes. With innovative solutions in e-commerce and m-commerce as well as for bricks-and-mortar shops, Concardis helps its customers realise sales across all channels and beyond national borders, thereby allowing them to profit from growing international retail.
The payment service provider constantly works to increase added value for merchants and consumers when it comes to payment through the expansion of its services and the integration of complementary products and services. Thanks to its many years of experience, its close bonds to retail and in-depth knowledge of the payment market, Concardis is a sought-after partner and trailblazer for new payment products.

Financial IT
Innovations in FinTech

DAVID SCHWARTZ ON DE-RISKING AND TECHNOLOGY

David Schwartz, president and chief executive of the Florida International Bankers' Association (FIBA), spoke to FinFuture – the Forum in Buenos Aires, where he was attending the annual conference of the Federation of Latin American Banks (FELABAN), about de-risking, technology, and where the industry is headed. Equipped with a dry sense of humour and an occasional twinkle in the eye, Schwartz says he has spent more time in 2016 than at any other point in the last four years on regulatory issues, travelling back and forth to Washington talking to various agencies, attending conferences, discussing de-risking and new initiatives and rule changes affecting the industry. "It never seems to stop. We have more dialogue. I appreciate dialogue. But dialogue can be interminable", he notes.

The central problem, in his view, is that banking has become over-regulated, and a victim of the law of unintended consequences, where well-meaning regulatory requirements can turn out to be ineffective or even counter-productive. "We can be over-regulated. I had this argument with the Treasury. They came out in March with the long-awaited customer due diligence beneficial ownership rule in the United States, something that had been lacking for many years, because it was obviously a Financial Action Task Force (FATF) recommendation, but the United States, which has a leadership position in FATF, didn't follow the rule." Schwartz noted it had taken the Treasury four and a half years to formulate the rule. "I told them I found it very coincidental that it finally came out after the uproar over the Mosack Fonseca issue in Panama asked what he thought of the rule Schwartz said that there was nothing new for the vast majority of FIBA's internationally active member banks who had already tightened up their risk vetting protocols. The various US regulators, including the Financial Crimes Enforcement Network (FinCEN) had agreed that banks must now know the identity of the beneficial owners of account-holding customer entities (beneficial owners are now defined as a anyone holding a 25% or greater equity stake in the company with which the bank is doing business). The aim is laudable: to crack down on the use of shell companies used to conceal potentially illegal money flows. To determine beneficial ownership the regulators have created a form that must be signed by customers, and have advised the banks that they can rely on the information so provided. But, as Schwartz puts it, most experienced banks know they cannot "for one second" rely on that information, and that they may be held liable and face sanctions if they fail to carry out further investigations that go "beyond the form" since they have to perform that higher standard of analysis and enquiry anyway.

Schwartz also questions the new requirement from the Office of the Comptroller of the Currency (OCC) that banks who close correspondent banking accounts as part of a de-risking policy must keep a full audit trail to justify the decision. "Why do I have to justify a business decision?" asks Schwartz, "I can understand justifying opening an account, but what does having to justify closing an account say about the relationship with my regulator?" The problem, he believes, is that the discussion is one sided and adversarial. Some regulators accuse the banks of not doing enough or even of not knowing how to assess risk. They also sometimes demand information and data that they are slow to share for the benefit of the system as a whole. Nor do they acknowledge the view from the bank side that an excess of regulation can itself become part of the problem. Schwartz found himself in a workshop in Havana last July trying to explain the US financial regulatory system to the head of the Cuban Central Bank, and mentioning that there are not only numerous federal but also 50 state-level regulators. "She told me that it all sounds very complex," Schwartz says, suggesting there are simply too many regulatory agencies, and the system needs reform.

What of the view that the banks, caught up in a tangle of regulations, have in other respects become conservative, even complacent, and are likely to face disruption from emerging fintech companies that are revolutionizing their business models? Schwartz doesn't agree that this is an accurate picture. In his view the banks are following the fintech scene closely and are poised to buy the new technologies or new companies when they prove their value. Technologies like blockchain provide faster and more efficient ways of moving funds from A to B, and can be used to cut bank costs, but do not, per se, help with compliance. As an example, he cites new technologies that can filter through multiple databases, including social media, to help banks perform background, know your customer (KYC)-type checks. But this doesn't eliminate "false positives": the fact that these systems cannot distinguish between many people with common names like "John Smith" or, in Latin America "Manuel Gómez", some of whom are law-abiding citizens, while others may be known money-launderers.

Schwartz argues that technology is pervasive and is driving big changes, but that it does not eliminate the need for banking skills and services. He has asked some fintech start-ups whether they have yet been subjected to regulatory examination and if not, how they are preparing for that: the answer he says they gave him was "that will be dealt with by our banking partner". The point is that banking skills are very much still a vital part of the equation. In Argentina technology, can help take banking services to the roughly 40% of the population that is unbanked. In Colombia gambling and finance companies are jointly developing points of sale, also for the unbanked. "I went to this one point of sale in an industrial area, full of little shops, and it was a place where you can buy your lottery ticket, or pay your electricity bill, but there was also a sign up there advertising BBVA banking services. Same thing in Peru: new technology is being used to reach out to the unbanked through an electronic wallet project. But at the end of the day who is there? The banks, not some mysterious fintech company."

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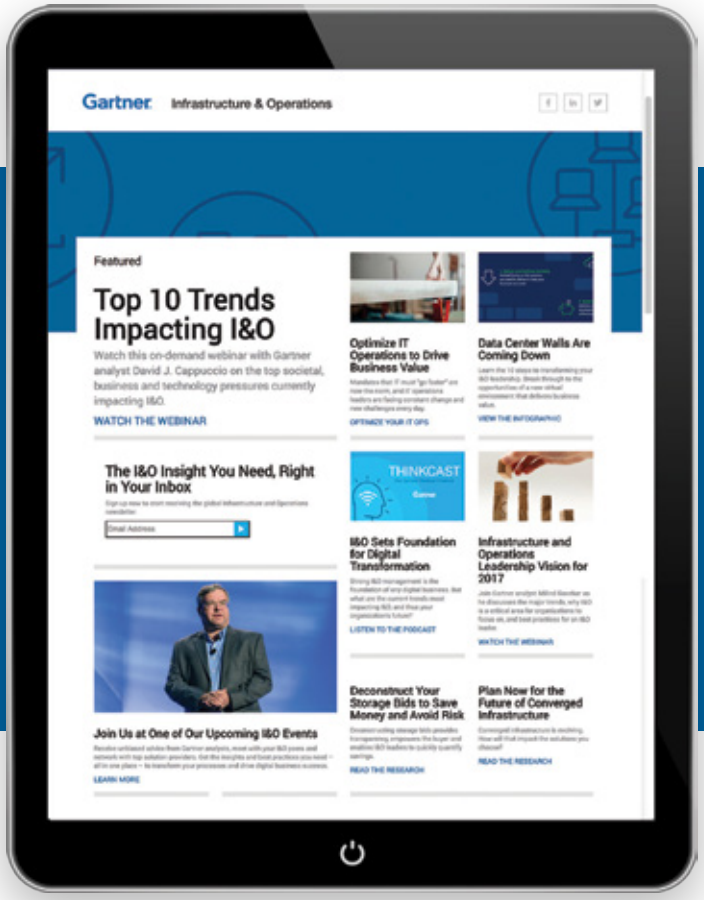

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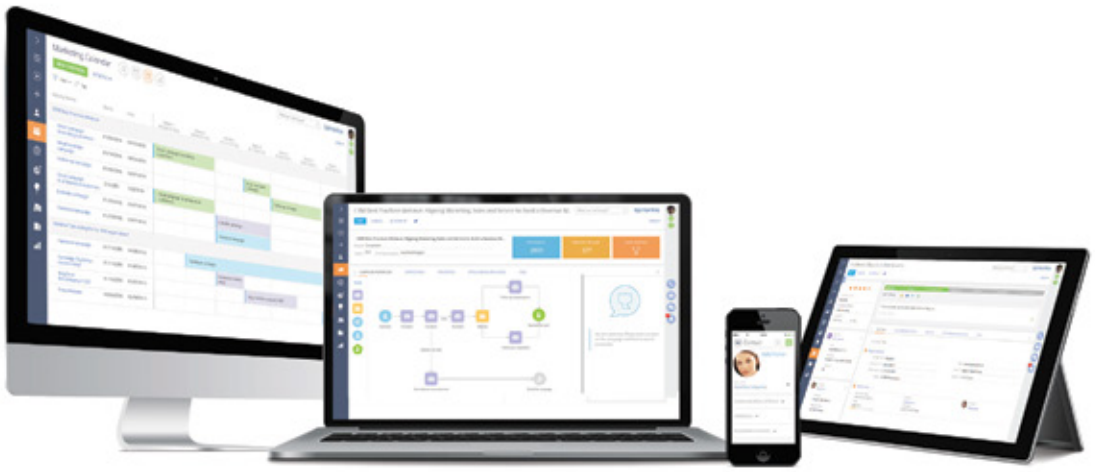

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Financial IT

Innovations in FinTech

TOP 50

DIGITAL ONLY BANKS

RANKING 2017

FINANCIAL IT'S DIGITAL BANK RANKING

WHAT ARE THE TWO QUESTIONS THAT REALLY MATTER?

In this edition of Financial IT, we are pleased to include our survey of digital banks, as a part of our commitment to identifying global pioneers at the intersection of technology and financial services.

We would stress that our ranking of digital banks is largely subjective. It is based on three criteria: media coverage of the digital bank in question; apparent numbers of employees; and an assessment of the overall impact of the digital bank.
We note that there may be digital banks that have inadvertently been omitted from the survey. We will be pleased to include them in future editions of the survey. We also accept that there may be compelling reasons why particular digital banks should be more highly ranked than indicated by us.

Digital banks matter for three reasons. They have emerged from nowhere in a relatively short period of time. Most are two years old - or younger. Many of the digital banks use radical and new technology to confirm the identities of clients and to meet Know Your Client (KYC) requirements. In theory, the digital banks could radically transform the financial services landscapes of the countries in which they operate.

The very phrase 'digital bank' identifies their key features. They are financial institutions, overseen by banking regulators, who reach their clients through mobile phone apps and/or through the Internet. Like traditional banks, they offer a variety of products and services - including, but emphatically not limited to, payments. Unlike traditional banks, they generally never have physical branch networks.

Collectively, the digital banks have a number of features in common. They are overwhelmingly business-to-consumer (B2C) in their offerings. Some digital banks see themselves as business-to-business (B2B) operations, providing 'white label' solutions to established companies that wish to go digital: however, these are a small minority. The digital banks tend to focus on customers who are in or near the countries in which they are based. For now, the digital banks are catering to the Assets side of their customers' balance sheets. Deposit and savings accounts are vastly more important than loans.

Nevertheless, the differences between the various digital banks are at least as important as the similarities. The digital banks do not all take the same approach, or use the same technology, to verify the identities of clients and the validity of transactions. Sometimes the digital banks are offshoots of long-established traditional banks; others, not. Above all, the digital banks sell themselves to actual and potential customers in different ways.

Some, for instance, emphasise the general convenience of handling a wide range of banking transactions from one's smartphone. Others emphasise the user-friendly aspects of their apps. Some are competing on the basis of low costs (in terms of fees paid by the customer), while others include cards as a part of their offer.

As of late 2017, the UK appears to be the leading market for digital banks, in that nearly one third of the companies in the ranking are based there. For now, we attribute this to the general sophistication of the financial services sector, customers' perceptions of the deficiencies of traditional banks, the vibrancy of the IT community that is based in London and a positive attitude on the part of the regulators.

In 2018, the UK may therefore be the country that provides the answers to the two questions about digital banks that really matter.

One question is: what do potential customers of the digital banks really want? Are they primarily looking for low cost solutions, and benefits from the branchless nature of the digital banks? Alternatively, are the customers looking mainly for a user experience that is only possible with cutting edge technology?

The answer to that question will shape the answer to the second: how will the established banks react to the challenge posed by the digital banks? One solution would be to leverage the established banks' strengths such as scale, brand, and breadth of offering. Alternatively, the established banks could transfer much or all of their retail banking, or B2C, operations to separate digital banking subsidiaries, and focus their core operations on commercial, or B2B operations. There are many other possibilities.

1 WeBank 微众银行

Photo source: www.yicaiglobal.com

Photo source: www.forbes.com

Company: WeBank
Inception: 2015
Location: China
Parent Company: Tencent, a Chinese internet company
Founder(s): Ma Huateng, founder, president,CEO and executive board member of Tencent
Zhidong Zhang (or Tony Zhang), co-founder, former CTO and second-largest individual shareholder of Tencent
Team Size: over 1000
Website: www.webank.com
Geo Coverage: Asia
Description: Named WeBank after Tencent's popular messaging app WeChat, the financial institution is the first private online bank in China. WeBank is a commercial bank with an online focus that utilizes facial recognition security software. WeBank offers small personal and auto loans, and investment products through their online platforms. For seven months period right after its official launch in January 2015, WeBank disbursed over CNY 800 million in "personal micro loans".

2 网商银行 MYbank

Photo source: fall2016.carlsonschoolmagazine.com

Company: MYbank
Inception: 2015
Location: China
Parent Company: Alibaba and its affiliate firm Ant Financial
Founder(s): Eric Jing, President of Ant Financial is also MYbank's Executive Chairman
Team Size: over 1000
Website: www.mybank.cn
Geo Coverage: Asia
Description: MYbank, one of China's first privately owned online banks. MYbank is a challenger bank that provides an entirely digital banking experience. MYbank provides inclusive and innovative financial solutions for customers based in urban and rural areas.

3 digibank by DBS

Photo source: www.gettyimages.com

Company: digibank by DBS
Inception: 2016
Location: Indonesia
Parent Company: DBS Bank
Founder(s): Piyush Gupta is Chief Executive Officer and Director of DBS Group
Team Size: over 500
Website: www.dbs.com/digibank
Geo Coverage: Asia
Description: digibank is a smart bank shrunk to fit into your smartphone. It's flexible, available and totally dependable with its high standards of safety. digibank is brought to you by DBS Bank, one of Asia's leading financial institutions that's recognised as the 'Safest Bank in Asia' by Global Finance for seven consecutive years.

4 CBD NOW

Photo source: www.khaleejtimes.com

Company: CBD NOW
Inception: 2016
Location: UAE
Founder(s): Dr Bernd van Linder, CEO of CBD
Team Size: over 500
Website: www.cbdnow.ae
Geo Coverage: Middle East
Description: CBD NOW is the UAE's first digital-only bank targeting millennial and digitally connected customers.

5 BankMobile

Photo source: www.theepochtimes.com

Company: BankMobile
Inception: 2015
Location: USA
Founder(s): Jay Sidhu, Luvleen Sidh
Team Size: over 500
Website: www.bankmobile.com
Geo Coverage: America
Description: BankMobile is a mobile application that offers a branchless banking experience without fees.

6 EQ Bank

Photo source: www.smithqueensu.ca

Company: EQ Bank
Inception: 2014
Location: Canada
Parent Company: Equitable Bank
Founder(s): Andrew Moor,
President and Chief Executive Officer at Equitable Bank
Team Size: over 500
Website: www.eqbank.ca
Geo Coverage: Canada
Description: EQ Bank is focused on providing a better banking experience – one that makes sense in today's go-anywhere, do-anything world. That means to give online money access 24/7 and a personalized Customer Care Centre that's not limited to banking hours. With no branches,EQ Bank offers clients great interest rates and no monthly fees on EQ Bank Savings Plus Account. EQ Bank is launched by Equitable Bank, a bank with over four decades of experience in the Canadian market.

7 Atom

Photo source: www.chroniclelive.co.uk

Company: Atom Bank
Inception: 2014
Location: UK
Founder(s): Anthony Thomson, Mark Mullen
Team Size: over 200
Website: www.atombank.co.uk
Geo Coverage: Europe
Description: Atom is building the UK's first bank designed specifically for digital, offering easy and convenient banking, along with unique and engaging ways to manage money. Atom has been recognised in KPMG's 2016 Fintech 100, being in the Top 10 companies using technology to drive disruption globally within the financial services industry.

8 Hello bank!

Photo source: www.chroniclelive.co.uk

Company: Hello bank!
Inception: 2013
Location: Belgium
Parent Company: BNP Paribas
Founder(s): Jean Lemierre, Chairman, BNP Paribas
Team Size: over 500
Website: www.hellobank.be
Geo Coverage: Europe
Description: Hello bank! is a digital direct bank owned by BNP Paribas that started operations in 2013. The bank operates in France, Belgium, Germany, Italy and Austria. BNP Paribas has claimed that is "the first 100% digital mobile bank in Europe".

9

Company: K Bank
Inception: 2017
Location: Korea
Parent Company: KT Corporation, formerly Korea Telecom, is South Korea's largest telephone company
Founder(s): Established by Financial Services Commission
Team Size: over 200
Website: www.kbanknow.com
Geo Coverage: South Korea
Description: K-Bank provides online banking services which include handling deposits, loans, credit cards, and providing wealth management products. The company is based in South Korea. K-Bank operates as a subsidiary of KT Corp.

10

Photo source: www.twitter.com

Company: N26
Inception: 2013
Location: Germany
Founder(s): Valentin Stalf
Team Size: over 200
Website: next.n26.com
Geo Coverage: Europe
Description: N26 is Europe's first Mobile Bank with a full European banking license and is setting new standards in banking. N26 has redesigned banking for the smartphone, making it simple, fast and contemporary. Opening a new bank account takes only eight minutes and can be done directly from your smartphone. Users receive mastercard to pay cashless or withdraw cash all around the world. They can block or unblock their card with a simple click and send money instantly to friends and contacts.

11

Photo source: www.thefinanser.com

Company: Starling Bank
Inception: 2014
Location: UK
Founder(s): Anne Boden
Team Size: over 50
Website: www.starlingbank.com/
Geo Coverage: Europe
Description: Starling Bank is creating a mobile app that will replace its clients' current accounts so they can make better decisions with their money.

12

Photo source: www.ukbusinessinsider.com

Company: Tandem Bank
Inception: 2013
Location: UK
Founder(s): Matt Cooper, Michael Kent, Ricky Knox
Team Size: over 50
Website: www.tandem.co.uk
Geo Coverage: Europe
Description: Tandem is creating a better bank, challenging legacy banking by building an app and products with input from their community of users. Tandem's goal is to make money simple, help their users save, and to free up their time from financial stress. Ultimately, Tandem aims to become a one-stop-shop for financial needs.

13

monzo

Photo source: www.tech.newstatesman.com

Company: Monzo
Inception: 2015
Location: UK
Founder(s): Tom Blomfield, Paul Rippon, Jonas Huckestein, Gary Dolman, Jason Bates
Team Size: over 50
Website: www.monzo.com
Geo Coverage: Europe
Description: Monzo (previously Mondo) is a digital, mobile-only bank in the UK. Monzo offers a high-tech banking app and credit card. It gives users instant balance updates and offers to its clients a range of intelligent notifications such as tracking recurring payments and providing summaries of exactly where their money goes each month. Monzo's users have spent more than £20m in over 130 countries since its launch.

14

soon... by AXA Banque

Photo source: www.twitter.com

Company: soon Banque
Inception: 2013
Location: France
Parent Company: AXA BANQUE
Founder(s): Jef Van In
Team Size: 500-1000
Website: www.soon.fr
Geo Coverage: Europe
Description: AXA Banque's SOON was created in 2013. SOON integrates the latest technological innovations in the banking world: NFC contactless payment, spending expenses with its relatives via Paypal.

15

orange™ bank

Photo source: pbs.twimg.com

Company: Orange Bank
Inception: 2017
Location: France
Parent Company: Orange Bank
Founder(s): Stéphane Richard, CEO and Chairman
Team Size: 501-1000
Website: http://www.orangebank.fr/la-banque-bientot/
Geo Coverage: France
Description: Orange Bank has not simply transferred conventional bank uses to an online application: From the start, they were designed for mobile phones. As a result, 100 percent of the transactions and interactions between the customer and Orange Bank can be carried out using a mobile phone.

16

monese

Photo source: www.fastcompany.com

Company: Monese
Inception: 2013
Location: UK
Founder(s): Norris Koppel
Team Size: over 50
Website: www.monese.com
Geo Coverage: Europe
Description: Monese was the first 100% mobile current account in the UK. Today, people from all over Europe can open a UK personal current account in minutes, free from the hidden fees and restrictions that legacy banks impose. Central to our offering is a revolutionary on-boarding process - customers can join instantly using our mobile app. Once installed, you follow simple step by step instructions to open and verify your account, including providing a picture of your passport or ID card, along with a video selfie. The advanced technology built into our app means that we can confirm your identity, and provide account details (account number and sort code) in just a few minutes.

17 PEPPER.

Photo source: www.did-conference.com

Company: Pepper
Inception: 2017
Location: Israel
Founder(s): Lilach Bar David, CEO, Pepper
Team Size: over 100
Website: www.pepper.co.il/en/
Geo Coverage: Europe
Description: Pepper was born to completely transform the banking world and bring you a state-of-the-art, fully transparent and completely fair account management, money transfer, and investing experience – all on your mobile, but with service from real human beings.

18 kakao

Photo source: www.theinvestor.co.kr

Photo source: www.koreatimes.co.kr

Company: Kakao Bank
Inception: 2016
Location: South Korea
Founder(s): Kim Beom-soo, Rim Ji-hoon , Lee Wooram
Team Size: over 50
Website: www.kakaocorp.com
Geo Coverage: South Korea
Description: Kakao Bank, South Korea's second internet-only bank that opened a month ago, is bringing the catfish effect in the local banking industry by drawing interest rates and commission cuts on traditional offline banks.

19 nu bank

Photo source: www.kaszek.com

Company: NUBank
Inception: 2014
Location: Brazil
Founder(s): David Vélez, Cristina Junqueira, Edward Wible
Team Size: over 200
Website: www.nubank.com.br
Geo Coverage: Latin America
Description: Nubank is the leading digital finance company in Brazil. The company offers a mobile credit card platform with platinum Mastercard credit services. It also provides a mobile app, with which customers can manage their daily transactions, credit limit and expenses in real time. Nubank is committed to fighting complexity and empowering Brazilians to take control of their finances. Over 3 million people have already applied for Nubank's credit card since it was launched on September 2014.

20

Company: B Bank
Inception: 2016
Location: UK
Founder(s): Powered by Clydesdale Bank & Yorkshire Bank
Team Size: over 100
Website: www.youandb.co.uk
Geo Coverage: Europe
Description: B is an intuitive digital banking service created for people who want to take more control of their money. With B, you get a current account, a savings account and an easy-to-use app for tablet and mobile. An app that's packed full of super-smart features to give you a clearer view of how you spend and save. Remember you'll need to use both your compatible tablet and smartphone to get all the features.

21

timo
POWERED BY VPBank

Company: Timo
Inception: 2016
Location: Vietnam
Founder(s): Claude Spiese
Team Size: over 50
Website: www.timo.vn/en/
Geo Coverage: Asia
Description: Timo is a new kind of bank that doesn't charge you fees, so you can focus on other things in life. This means you can withdraw at 15,700 ATMs and transfer to anyone in Vietnam all fee free while enjoying interest on your deposits.

22

Revolut

Photo source: www.bdaily.co.uk

Company: Revolut
Inception: 2014
Location: UK
Founder(s): Nikolay Storonsky, Vlad Yatsenko
Team Size: 11-50 employees
Website: www.revolut.com
Geo Coverage: Europe
Description: Revolut is a global money app that includes a pre-paid debit card, currency exchange, and peer-to-peer payments. Revolut currently charges no fees for the majority of its services, and claims to use interbank rates for its currency exchange.

23

Tide

Photo source: www.yicaiglobal.com

Company: Tide
Inception: 2017
Location: UK
Founder(s): Saul Klein, Robin Klein, Ian Hogarth
Team Size: 11-50 employees
Website: www.tide.co
Geo Coverage: Europe
Description: Tide is a banking service designed especially for small businesses. We automatically categorise your transactions as you make them, so your bookkeeping is done before your accountant starts work. Upload any invoice from a supplier and Tide will read it to prepare a payment for you – no typing required!

24

CLEARLY

Company: BankCLEARLY
Inception: 2016
Location: UAE
Founder(s): Fara Remtulla, Philippe De Backer
Team Size: 11-50 employees
Website: www.bankclearly.co
Geo Coverage: Middle East
Description: We are tearing up everything you know about banking and re-building it from the ground up. It's going to be defined and shaped by us together.

25

Photo source: www.thememo.com

Company: Bud
Inception: 2015
Location: UK
Founder(s): Edward Maslaveckas
Team Size: 11-50 employees
Website: www.thisisbud.com
Geo Coverage: Europe
Description: Bud is a banking app and website that aggregates financial services: you can use all of your financial apps in one place. Traditional banks, fintech companies and other financial services, you can use them all. Bud is the most customisable and future proof innovation in banking. It's a completely new way to take control of your personal finances.

27

Photo source: www.angel.co.com

Company: Penta
Inception: 2016
Location: Germany
Founder(s): Lav Odorovic (CEO) and Luka Ivicevic (Growth)
Team Size: 24
Website: www.getpenta.com
Geo Coverage: Europe
Description: Marketplace of business apps and financial products for businesses in one bank account.

26

Photo source: www.11fs.com

Company: LootBank
Inception: 2016
Location: UK
Founder(s): Ollie Purdue
Team Size: 11-50 employees
Website: www.loot.io
Geo Coverage: Europe
Description: This is Loot: a current account and contactless Loot Mastercard® card, offering insights into your spending with personalised features to manage your money. Whether you're working towards an around the world trip or your next meal out, Loot believes there's never a reason to miss out. Loot's investors include SpeedInvest (Holvi, Curve) and Global Founders Capital (iwoca, Kreditech).

28

Photo source: www.linkedin.com

Company: Xinja
Inception: 2017
Location: Australia
Founder(s): Eric Wilson, Founder & CEO
Team Size: 10-24 employees
Website: www.xinja.com.au
Geo Coverage: Australia & New Zealand
Description: Xinja is building Australia's first, independent,100% digital bank designed for mobile; re-imagining the banking experience in customers' interests. Following the success of 'neobanks' in Europe and the US, the founders felt it was time Australians had access to this kind of technology (and indeed that there was an opportunity to 'leapfrog' these trailblazer international products by introducing new features); apps that help customers make the most out of their money. As Xinja rolls out deposit accounts, mortgages and other products, the lack of branches and costly legacy systems means low or no fees and more competitive rates. And unlike other banks, Xinja is designing with customers. Products are developed around specific problems, and customers are articulating these via interviews, workshops, and (soon) online forums.

29

Photo source: www.euroman.dk

Company: Lunar Way
Inception: 2015
Location: Denmark
Founder(s): Ken Villum Klausen
Team Size: 11-50 employees
Website: www.lunarway.com
Geo Coverage: Europe
Description: Lunar Way is digital banking for the millennial generation. They believe in banking that is easy, personal and driven by mobile technology. They think banking should be about having a digital extension of the lives they live individually in order to manage their finances in an open, friendly and collaborative way.

30

Photo source: www.linkedin.com

Company: Qonto
Inception: 2016
Location: France
Founder(s): Alexandre Prot, Steve Anavi
Team Size: 10-24 employees
Website: www.qonto.eu
Geo Coverage: Europe
Description: Qonto is the only neobank dedicated to small businesses. Qonto aims to become the next generation bank for entrepreneurs, SMEs and startups by providing an online service that will allow them to create an account in less than 5 minutes, instantly receive an IBAN and get started to manage the company's physical and digital business cards and perform their day to day operations.

31

Photo source: www.aspectusventures.com

Company: Chime
Inception: 2013
Location: USA
Founder(s): Ryan King, Chris Britt
Team Size: 11-50 employees
Website: www.chimebank.com
Geo Coverage: USA
Description: Chime is a new kind of bank account that helps members lead healthier financial lives and automate their savings. How do we do this? By eliminating unnecessary fees and using technology to help our members form healthy financial habits. With Chime, you get a Chime Visa Debit Card and an FDIC bank account that can be managed entirely from your smartphone.

32

Company: BTCPOP
Inception: 2014
Location: UK
Founder(s): Danielle Free
Team Size: 11-50 employees
Website: www.btcpop.co
Geo Coverage: Europe
Description: BTCPOP offers a unique P2P Banking experience with Instant Loans, Investment Pools, Collateral Tied Loans & More. We are constantly improving and developing our services.

33 goHenry

Photo source: www.crowedcube.com

Company: goHenry
Inception: 2016
Location: UK
Founder(s): Alex Zivoder
Team Size: 11-50 employees
Website: www.gohenry.co.uk
Geo Coverage: Europe
Description: GoHenry is a service that helps teach children how to manage and save their money. It comes complete with a debit card, clever parental controls, easy to use app, and peace of mind.

34 KUDI

Photo source: www.linkedin.com

Company: KUDI
Inception: 2016
Location: Africa
Founder(s): Babatunde Babs Ogundeyi
Team Size: 11-50 employees
Website: www.kudimoney.com
Geo Coverage: Africa
Description: We are building a Pan African Digital Bank. A bank without boundaries, a bank that allows you access to your money (and our money) whenever you need it. We recently launched our first product, an online lending platform that allows you to access finance from the comfort of anywhere you happen to be. Our vision for lending is to make finance more accessible, our desire is to over time lower the cost and barriers to consumer lending.

35 TOUCH BANK

Company: Touch Bank
Inception: 2015
Location: Russia
Parent Company: OTP Group
Team Size: 201-500 employees
Website: www.touchbank.com/
Geo Coverage: Asia
Description: Touch Bank is an online banking startup launched in Russia by a European banking group (OTP Group). Touch Bank is creating a non-conventional bank beyond traditional brick-and-mortar limitations. No branches, no queues, no annoying paperwork – all services shall be provided over the Internet and smartphone apps with strong digital support, and exceptional customer support. Ease of use and convenience for clients are our top priorities.

36 osper

Photo source: www.linkedin.com

Company: Osper
Inception: 2012
Location: UK
Founder(s): Alick Varma
Team Size: 11-50 employees
Website: www.osper.com
Geo Coverage: Europe
Description: Osper is a prepaid debit card and mobile banking service empowering young people to manage their money responsibly by instilling good financial habits from an early age. It offers a safe MasterCard prepaid debit card and a simple mobile banking app with separate logins for young people and parents. All money on Osper is safely managed by a European regulated bank. Its application runs on Android and Apple devices that also include any iOS device running 6.0 or higher.

37

Photo source: www.linkedin.com

Company: Crypterium
Inception: 2017
Location: Cyprus
Founder(s): Gleb Markov, Vladimir Gorbunov, Austin Kimm
Team Size: 11-50 employees
Website: www.crypterium.io
Geo Coverage: Europe
Description: Cryptobank for cryptopeople. Date of ICO launch - October 31, 2017.

38

Bank-Genie™

Company: Bank Genie
Inception: 2016
Location: Singapore
Founder(s): Ramkumar Sarma
Team Size: 2-10 employees
Website: www.bank-genie.com
Geo Coverage: Asia
Description: Bank-Genie a FinTech startup based out of Singapore. Bank-Genie's vision is to simplify rudimentary branch banking using technological innovation. Our present innovations are Bank-Genie : Our Flagship solution for Banks to reduce CAPEX for installation of new branches. Bank-Genie helps banks open branches anywhere from Malls to supermarkets. Genie-Teller helps Banks to innovatively manage NO Q and improve productivity in the Banking Halls. Its the modern "NO Q management".

39

Photo source: www.linkedin.com www.checkout.fi

Company: BankItOn!
Inception: 2014
Location: Finland
Founder(s): Mikko Riikkinen, Perttu Kröger, Lauri Eskola
Team Size: 2-10 employees
Website: www.bankiton.com
Geo Coverage: Europe
Description: Bankiton! provides consumers smart way to compare and switch retail banking services, by simply chatting in social media apps. Our AI-powered recommendation engine and simple chat interface makes finding best fit banking solutions a breeze for consumers, whilst providing risk-free option for financial service providers to attract the type of customers they prefer to have.

40

Photo source: www.inc.com

Company: GoBank
Inception: 2013
Location: USA
Founder(s): Sam Altman, Alok Deshpande
Team Size: 1-10 employees
Website: www.gobank.com
Geo Coverage: USA
Description: GoBank is an online bank that offers cash and direct deposits, photo check deposits, an ATM network, and more. It was founded in 2013 and is based in Monrovia, California.

41

Photo source: www.linkedin.com, www.finextra.com

Company: Ummah Finance
Inception: 2016
Location: UK
Founder(s): Martin Luther Maramba, Hassan Waqar
Team Size: 2-10 employees
Website: www.ummah-finance.uk
Geo Coverage: Europe
Description: Ummah Finance is set out on a mission to change the way Muslims in the UK bank. We are building a mobile bank which will incorporate all the features of a standard bank but making it Sharia Compliant.

43

Company: Bettr Finance
Inception: 2015
Location: Africa
Founder(s): Tobie van Zyl, Angus Brown and Andrzej Stempowski
Team Size: 2-10 employees
Website: www.bettr.finance
Geo Coverage: South Africa
Description: We're a fintech company with the vision to financially empower those who know their worth. How? By providing tech and tools that improve the way you bank, save, borrow, insure and invest your money. If you believe you deserve better than the traditional financial system, join us in the future. Where finance is more transparent, flexible, responsible and meaningful.

42

Photo source: www.linkedin.com

Company: Koho
Inception: 2014
Location: Canada
Founder(s): Daniel Eberhard
Team Size: 11-50 employees
Website: www.koho.ca/
Geo Coverage: Global
Description: Koho is a high profile FinTech company backed by some of the leading investors and advisors across Canada and Silicon Valley. More than 9,500 Canadians have signed up to join Koho and we're bringing our no-fee, modern, mobile alternative to market.
Koho offers the Koho Visa* Prepaid Card and mobile app that together allow users to manage daily financial needs (direct paycheque load, bill pay, atm cash withdrawals, etc.), while offering tools such as automated savings goals, real-time updates, transfers, spending insights and categorizations and much more.
***The Koho Visa Prepaid card is issued by Peoples Trust Company pursuant to license by Visa Int.*
**Trademark of Visa Int., used under license."*

44

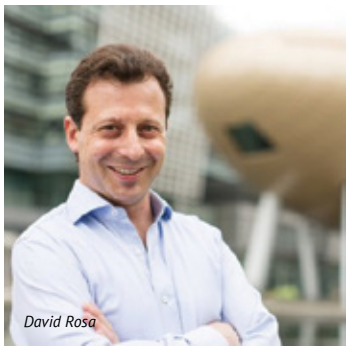

Photo source: www.linkedin.com

Company: Neat Ltd
Inception: 2015
Location: Hong-Kong
Founder(s): David Rosa, Igor Wos
Team Size: 2-10 employees
Website: www.neat.hk
Geo Coverage: Asia
Description: Neat is faster, friendlier and more modern than a bank. The idea behind Neat is "lots of people aren't getting the help they deserve when it comes to managing their finances". Neat allows customers to open new accounts in just 10 minutes and everything can be done through the app from anywhere in the world. Customers do not have to waste time visiting a branch. Neat's customers have access to Neat MasterCard, online or offline, and get the best exchange rate for over 50. With Neat customers can send money to their friends instantly. Split the bill when they ate out for dinner or on a trip with friends.

45

Company: CANDI
Location: India
Geo Coverage: India
Inception: 2017
Website: www.canarabank.com
Description: CANDI aims to provide an end-to-end digital experience to customers. The most eye-catching feature of the digital bank is the infusion of AI. A humanoid has been introduced in the branch to addresses basic queries of customers on banking products and services. With this innovative approach, the bank becomes the first in the public sector category to initiate AI in banking.

46

www.thebusinessyear.com

Company: Altyn-i
Location: Kazakhstan
Founder(s): Askar S. Smagulov, Member of the Management Board, CEO
Inception: 2017
Website: www.altyn-i.kz
Description: Altyn-i is an online bank, a separately created brand of JSC "Altyn Bank". JSC "Altyn Bank", a subsidiary of Halyk Bank of Kazakhstan JSC, has been present on the Kazakhstan market since 1998. In the past it is known as "HSBC Bank Kazakhstan JSC". Altyn Bank's ratings are at the same level with the parent structure of Halyk Bank, which indicates stability and trust in the organization.

47

Photo source: www.linkedin.com

Company: YoloLite
Location: Singapore
Team Size: 2-10 employees
Geo Coverage: Asia
Inception: 2014
Founder(s): Ravi Patel
Website: www.yolopay.com.sg
Description: YoloPay is the first digital banking solution designed for families. Designed for busy families with children or domestic helpers, families can now transfer money instantly and for free amongst the household and then spend responsibly using Visa prepaid debit cards.

48

Company: Jenius
Location: Indonesia
Website: www.jenius.com
Inception: 2016
Founder(s): BTPN parent company
Geo Coverage: Indonesia
Description: Jenius is a mobile banking channel created to deliver to the needs of the ever changing consumer who wants convenience on the move.

49

Photo source: www.fintechzone.hu

Company: Taqanu
Location: UK
Team Size: 2-10 employees
Geo Coverage: Africa
Inception: 2016
Founder(s): Balázs Némethi
Website: www.taqanu.com
Description: Taqanu is opening the financial ecosystem for anyone by using a blockchain based digital ID to enable financial inclusion and create equal opportunities. It is a simple financial solution that aims to become a banking service that anyone can use once they have established a digital identity to granular standards. It uses the digital footprint to identify and authenticate people with a very high degree of accuracy and use this newly created digital ID to onboard people to a banking solution. The self-sovereign digital ID gives the ownership of data to our customers with the use of blockchain technology and encryption.

50

Photo source: www.LinkedIn.com

Company: Zazu bank
Location: Zambia
Team Size: 2-10 employees
Geo Coverage: Africa
Inception: 2015
Founder(s): Perseus Miambo
Website: www.zazuafrica.com
Description: Zazu is a digital money account that keeps you in the know. Zazu gives you instant updates of your spending on its companion app, available on Android and iOS. It automatically categorises your spending, allows you to set savings goals, pay friends instantly, and much more.

Photo courtesy of Freepik

FINVENTURES Global Directories

FinFuture is the Forum of the Future of Finance. An efficient forum is one where the actual and potential members can be identified readily.

Recognizing this, the FINVENTURES Global Directories will be a central feature of the FinFuture publications.

Over time, we hope to build the definitive list of who is really who at the intersection of global trade and finance with technology.

But that is a complicated place. Accordingly, we are looking to develop five directories – FINVENTURES Financiers, FINVENTURES Banking/Payments Innovators, FINVENTURES Consultants, FINVENTURES Scholars and FINVENTURES Corporate Treasurers.

And we need your help.

There will be two kinds of entries in the directories – Unpaid and Paid.

An Unpaid entry may be submitted by anyone. It will be basic in that it identifies the name of the organization and the country.

A Paid entry will cost 500 GBP / 600 EUR / 700 USD for one year. It will identify the name of the organization, the country, key individual(s) [up to two per entry] and the relevant URL. It will be shown in bold font.

DETAILS FOR UNPAID ENTRY

- Directory [Drop-down Box with five options]
- Name of Organization
- Country
- Identity of person submitting the Entry
- Organizational affiliation of person submitting the Entry
- E-mail of person submitting the Entry

SAMPLE OF UNPAID ENTRY
Great Wall Investments China

DETAILS FOR PAID ENTRY

- Directory [Drop-down Box with five options]
- Name of Organization
- Name of Individual 1
- Title of Individual 1
- Name of Individual 2
- Title of Individual 2
- Country
- URL
- Identity of person submitting the Entry
- Organizational affiliation of person submitting the Entry
- E-mail of person submitting the Entry
- Payment Details

SAMPLE OF PAID ENTRY
VOC Technologies Netherlands Dries Vermeulen, CFO Bart Smit VP
www.voctechnologies.nl

FINVENTURES FINANCIERS

A global listing of venture capital and private equity firms that are investing in banking, payments, blockchain, financial infrastructure, financial IT and FinTech enterprises.

Growth Angels	Australia
NAB Ventures	Australia
Reinventure	Australia
Quantres	Bahamas
Kown	Bulgaria
Nest Investments	China
VC.cn	China
Cyprus Capital Partners	Cyprus
360 Capital Partners	France
Breega Capital	France
Kima Ventures	France
Partech Ventures	France
1stMOVER	Germany
3e Capital Group	Germany
Acton Capital Partners	Germany
Astutia Ventures	Germany
Atlantic Capital Partners	Germany
Atlantic Labs	Germany
Aurelia Private Equity	Germany
Avala Capital	Germany
Axel Springer Digital Ventures	Germany
Axel Springer Plug and Play Accel.	Germany
BambooVentures	Germany
Banson e.V.	Germany
Bauer Venture Partners	Germany
BC Brandenburg Capital	Germany
Berlin Technologie Holding	Germany
Berlin Ventures	Germany
Berliner Volksbank Ventures	Germany
Betafabrik	Germany
BFB Frühphasenfonds Brandenburg	Germany
bmp	Germany
Burgey Business Group	Germany
Business Angels Club Berlin-Brandenburg e. V.	Germany
Business Angels Region Stuttgart	Germany
Campus Venture	Germany
Campus Venture Beteiligungs	Germany
capiton AG	Germany
Capnamic Ventures	Germany
Catagonia Capital	Germany
CatCap	Germany
Cherry Ventures	Germany
Clover Venture	Germany
CNM Ventures	Germany
CologneInvest	Germany
CommerzVentures	Germany
Computec Media	Germany
Creathor Venture	Germany
Credit Agricole Private Equity	Germany
Cresces	Germany
Crossventures	Germany
Curtis newton labs	Germany
Cycoon	Germany
Dariani, Ehssan	Germany
Deutsche Bank Innovation Lab Berlin	Germany
Die Business Angels Region Stuttgart	Germany
Dieter von Holtzbrinck Ventures GmbH	Germany
Direct Relation	Germany
Dirk Freytag	Germany
DocCheck Guano	Germany
DuMont Venture	Germany
DVH Ventures	Germany
Earlybird	Germany
Ebner Verlag	Germany
Ecommerce Alliance	Germany
ECONA	Germany
EKK Dr. Engelhardt, Kaupp, Kiefer	Germany
estag Capital	Germany
estag/Capital AG	Germany
European Founders Fund	Germany
eVenture Capital Partners	Germany
FinLeap	Germany
FintechStars GmbH	Germany
First Love Capital	Germany
Florian Huber	Germany
Found Fair Ventures	Germany
Founders Capital	Germany
FoundersLink	Germany
FS Vencube	Germany
Gadowski, Lukasz	Germany
Gauly Dittrich van de Weyer Bet.	Germany
German Startups Group	Germany
Glänzer, Stefan	Germany
GO:INcubator	Germany
Grazia Equity	Germany
Greenhouse Innovation Lab	Germany
Gruner&Jahr	Germany
GTEC Operations GmbH	Germany
HackFwd Capital GmbH & Co. KG	Germany
Hanitsch, Andreas	Germany
Hanse Ventures	Germany
Hasso Plattner Ventures	Germany
HCM Handwerk Capital Management	Germany
HCS Beteiligungsgesellschaft	Germany
Hebenstreit, Kolja	Germany
Heilemann Ventures	Germany
Heinemann, Florian	Germany
Heliad Equity Partners	Germany
High-Tech Gründerfonds	Germany
Hillmann, Ron	Germany
Hoffmann, Jens	Germany
Holtzbrinck eLab	Germany
Holtzbrinck Networks	Germany
Holtzbrinck Ventures	Germany
Hommels, Klaus	Germany
Howzat media	Germany
HR Alpha Venture Partners	Germany
HR Ventures	Germany
hub:raum	Germany
i5invest	Germany
IBB Beteiligungsgesellschaft	Germany
IEG – Investment Banking Group	Germany
iSteps Widget Ventures	Germany
Iven, Arend Lars	Germany
iVentureCapital	Germany
J.C.M.B.	Germany
Janz, Christoph	Germany
Jochen Schweizer Ventures	Germany
Jung, Oliver	Germany
K – Invest	Germany
Kabel, Peter	Germany
Keller, Urs	Germany
KfW Bankengruppe	Germany
Kizoo	Germany
Kleindl, Michael	Germany
KlickVentures	Germany
KP TECH Corporate Finance	Germany
Kunath, Jens	Germany
M. DuMont Schauberg	Germany
main incubator	Germany
Main Incubator GmbH, Commerzbank	Germany
Maire, Christophe	Germany
Markenmacher Media & Venture	Germany
markt.gruppe	Germany
Mayflower	Germany
MAZ level one	Germany
Media Ventures	Germany
MGO Digital Ventures	Germany
Mobile Ventures GmbH	Germany
Monkfish Equity	Germany
Morschheuser, Stefan	Germany
Mountain Partners	Germany
Mountain Super Angel	Germany
MoveToSaaS	Germany
Munich Business Angel Network	Germany
Munich Investors Circle	Germany
Munich Venture Partners	Germany
MVC Unternehmensbeteiligungsgesellschaft mbH	Germany
Neef, Paulus	Germany
Neuhaus Partners	Germany
Newten Ventures	Germany
NRW Bank Investment	Germany
Odeon Management-Partners	Germany
Omnis Mundi	Germany
Omnis Mundi Invest	Germany
Partech International	Germany
Partech Ventures	Germany
Paua Ventures	Germany
Pinova Capital GmbH	Germany
Point Nine Capital	Germany
Project A Ventures	Germany
ProSiebenSat.1	Germany
PVM Private Values Media	Germany
Rebate Networks	Germany
Redalpine Venture Partners	Germany
Redstone Digital	Germany
Rheingau Founders	Germany
RI Digital Ventures	Germany
Richmond Park Partners	Germany
Richmond View Ventures	Germany
Robert Bosch Venture Capital GmbH	Germany
Rocket Internet	Germany
Saarländische Wagnisfinanzierungsg	Germany
Samwer, Alexander, Marc, Oliver	Germany
Schmiegelow, Axel	Germany
Schneider, Karsten	Germany
Schubert, Stephan	Germany
Schumacher, Tim	Germany
Schüpbach, Peter	Germany

Seven Ventures	Germany
SevenOne Intermedia	Germany
Seventure Partners	Germany
SHS Gesellschaft für Beteiligungsmanagement	Germany
Sinner, Martin	Germany
Sixt Ventures	Germany
Startupbootcamp Berlin	Germany
Statkraft Ventures	Germany
Steadfast Capital	Germany
Storch, Matthias	Germany
Straub Ventures	Germany
Taishan Invest	Germany
Target Partners	Germany
Team Europe	Germany
Team Europe Ventures	Germany
Tengelmann E-Commerce	Germany
TheMediaLab	Germany
Thyssen, Maximilian	Germany
Tiburon Unternehmensaufbau	Germany
Tivola Ventures	Germany
Tomorrow Focus	Germany
T-Online Venture Fund	Germany
TowerVenture	Germany
Triangle Venture Capital	Germany
U.C.A.	Germany
United Internet	Germany
Unternehmertum Venture Capital Partners GmbH	Germany
VC Fonds Kreativwirtschaft Berlin	Germany
VCDE Venture Partners	Germany
VC-POINT GmbH	Germany
Ventegis Capital	Germany
Ventegis Capital AG	Germany
VHB ventures	Germany
VM Digital	Germany
Vogel Ventures	Germany
Vollmann, Christian	Germany
VR Equitypartner	Germany
wallstreet:online	Germany
Web Holding AG	Germany
Wellington Partners	Germany
Wertz, Boris	Germany
WestTech Ventures	Germany
Wiskemann, Stefan	Germany
XAnge Private Equity	Germany
XL Health AG	Germany
yabeo Capital GmbH	Germany
You is Now	Germany
ACT Venture Capital Limited	Ireland
Aleph	Israel
Financial Immunities Ltd.	Israel
Genesis Partners	Israel
Lionbird (Ventures) Ltd.	Israel
Magical Capital	Israel
3LB Seed Capital S.r.l.	Italy
Digital Magics	Italy
Neva FINVENTURES	Italy
UniCredit Start Lab `	Italy
MOJO Capital	Luxembourg
SGH Capital	Luxembourg
ABN AMRO Bank N.V.	Netherlands
Velocity Capital	Netherlands
Xevin Investments	Poland
Life.SREDA	Russia
IDM Venture Capital	Singapore
Standard Chartered Private Equity Limited	Singapore
Grupo Intercom Berlin	Spain
Creandum Advisor Sweden	Sweden
b-to-v Partners AG	Switzerland
Centralway Ventures	Switzerland
Creathor Venture	Switzerland
Highland Capital Partners Europe	Switzerland
Index Ventures	Switzerland
Kickstart Accelerator; c/o Impact Hub	Switzerland
Lakestar	Switzerland
Mountain Digital Media GmbH	Switzerland
Orange Growth Capital	Switzerland
Redalpine Venture Partners AG	Switzerland
SIX Group	Switzerland
Swiss FinTech Innovation Lab	Switzerland
Accel Partners	UK
Anthemis Group	UK
Apis Partners	UK
Ayondo Holding AG; (Next Generation Finance Invest)	UK
Bain & Company	UK
Balderton Capital	UK
Barclays Accelerator	UK
Blenheim Chalcot	UK
Cabot Square Capital LLP	UK
Coinsilium	UK
CVC Capital Partners Limited	UK
Deutsche Bank Labs London	UK
Elderstreet Investments Ltd	UK
Felix Capital	UK
FINVENTURES Ltd	UK
Force Over Mass Capital	UK
Fundacity	UK
Highland Capital Partners Europe	UK
Hoxton Ventures	UK
Index Ventures	UK
LeVenture Capital	UK
Mustard Seed	UK
Northedge Capital LLP	UK
Northzone Ventures	UK
Octavian Ventures	UK
Octopus Investments	UK
Passion Capital	UK
Richmond Park Partners	UK
Santander InnoVentures	UK
Santander InnoVentures	UK
SBT Venture Capital	UK
Startup Boot Camp	UK
Techstars Ventures	UK
UK Trade & Investment (UKTI)	UK
Warburg Pincus International LLC	UK
Kaszek Ventures	Uruguay
Mayfield	USA
1/0 Capital, LLC	USA
1776	USA
500startups	USA
Accel Partners	USA
Affirm	USA
American Express Ventures	USA
Andreessen Horowitz	USA
AngelList	USA
Angle	USA
Arbor Ventures	USA
Archimede Labs	USA
August Capital	USA
Bain Capital Ventures	USA
Bank Innovation INV	USA
Baseline Ventures	USA
Basepoint Ventures	USA
Battery Ventures	USA
BBVA Ventures	USA
Benchmark Capital	USA
Bessemer Venture	USA
Bison	USA
BISON Alternatives	USA
Blackbox Accelerator	USA
Blackstone	USA
Blockchain Capital	USA
Blue Run Ventures	USA
Blumberg Capital	USA
BOKU	USA
Breyer Capital	USA
Canaan Partners	USA
Capgain Solutions	USA
Captable.io	USA
CircleUp	USA
Citi Ventures	USA
Commerce Ventures	USA
Conversion Capital	USA
Core Innovation Capital	USA
Corum Group	USA
Crowdfunder	USA
CRV	USA
Cultivation Capital	USA
Deutsche Bank Labs Silicon Valley	USA
DreamFunded	USA
Edison Ventures	USA
Equidate	USA
Felicis Ventures	USA
FinTech Collective	USA
First Round Capital	USA
Flybridge	USA
Foundation Capital	USA
Founders Fund	USA
FTV Capital	USA
Garage Technology Ventures	USA
gener8tor	USA
General Atlantic	USA
General Catalyst Partners	USA
German Accelerator	USA
Glenbrook	USA
Green Visor Capital	USA
GreenDot (GDOT)	USA
Greylock Partners	USA
Heroku	USA
Highland Capital Partners Europe	USA
IA Capital Group	USA
IA Ventures	USA
IdeaMarket	USA
Index Ventures	USA
Innovation Endeavors	USA
iNovia Capital	USA
Intuit	USA
Ironfire Capital	USA
Jaguar Capital Partners	USA
Khosla Ventures	USA
Kleiner Perkins Caufield & Byers	USA
Launchpad LA	USA
LendTech Angels	USA
Lightspeed Venture Partners	USA
Lightyear Capital	USA
LLR Partners	USA
Lowercase Capital	USA
Matrix Partners	USA
MHS Capital	USA

Morgenthaler	USA
Mucker Capital	USA
Neu Venture Capital	USA
New Enterprise Associates (NEA)	USA
North Hill Ventures	USA
Norwest Venture	USA
Nyca Partners	USA
OCA Ventures	USA
Omidyar	USA
Opus Capital	USA
Origin Ventures	USA
OurCrowd	USA
Partech Ventures	USA
PayActive, Inc.	USA
Personal Capital	USA
Pinnacle Ventures	USA
PitchBook Data	USA
Pivot Investment Partners LLC	USA
Plug and Play Tech Center	USA
ProSeeder Technologies	USA
QED investors	USA
Redpoint Ventures	USA
Relay Ventures	USA
Ribbit Capital	USA
Richmond View Ventures	USA
Rose Tech Ventures	USA
Route 66 Ventures	USA
RRE	USA
Rugged Ventures	USA
Salmon River Capital	USA
Santander InnoVentures	USA
Sequoia Capital	USA
SignalFire	USA
Silicon Alley Venture Partners LLC	USA
Silver Lake	USA
SK Ventures	USA
Slow Ventures	USA
Social Leverage Research	USA
SoftTech Ventures	USA
Spark Capital	USA
Spring Lake Equity Partners	USA
Stripe	USA
Summit	USA
Susquehanna Investment Group	USA
SV Angel	USA
TCV	USA
Tech Coast Angels	USA
Techstars Ventures	USA
Techstarts Ventures	USA
The Brenner Group, LLC	USA
Thrive Capital	USA
Tribeca Venture Partners	USA
True Ventures	USA
TTV Capital	USA
Union Square Ventures	USA
Upfront Ventures	USA
UpWest Labs	USA
ValueStream Labs	USA
Venture Scanner	USA
Vernon and Park	USA
Visible	USA
Vulcan Capital	USA
WealthCloud, LLC	USA
Wildcat Venture Partners	USA
XOOM	USA
Zenefits	USA

FINVENTURES BANKING/PAYMENTS INNOVATORS

Listings for innovation executives (CEO, CMO, CIO, Chief Innovation Officer, Chief Digital Officer, Managing Partner for bank's VC subsidiary with their corporate Web addresses and their corresponding points of contact) in relation to institutions that are systemically important at a global and national level.

SYSTEMICALLY IMPORTANT BANKS - GLOBAL

Dexia Group	Belgium
Agricultural Bank of China	China
Bank of China	China
China Construction Bank	China
ICBC	China
Banque Populaire CE	France
BNP Paribas	France
Crédit Agricole	France
Société Générale	France
Commerzbank	Germany
Deutsche Bank	Germany
Unicredit Group	Italy
Mitsubishi UFJ FG	Japan
Mizuho FG	Japan
Sumitomo Mitsui	Japan
ING Bank	Netherlands
Banco Bilbao Vizcaya Argentaria	Spain
Santander	Spain
Nordea	Sweden
Credit Suisse	Switzerland
UBS	Switzerland
Barclays	United Kingdom
HSBC	United Kingdom
Lloyds Banking Group	United Kingdom
Royal Bank of Scotland	United Kingdom
Standard Chartered	United Kingdom
Bank of America	United States
Bank of New York Mellon	United States
Citigroup	United States
Goldman Sachs	United States
JP Morgan Chase	United States
Morgan Stanley	United States
State Street	United States
Wells Fargo	United States

SYSTEMICALLY IMPORTANT BANKS - NATIONAL

Australia and New Zealand Banking Group	Australia
Commonwealth Bank of Australia	Australia
National Australia Bank	Australia
Westpac Banking Corporation	Australia
Bank of Montreal	Canada
Bank of Nova Scotia	Canada
Canadian Imperial Bank of Commerce	Canada
Desjardins Group	Canada
National Bank of Canada	Canada
Royal Bank of Canada	Canada
Toronto-Dominion Bank	Canada
Danske Bank	Denmark
DLR	Denmark
Jyske Bank	Denmark
Nordea Denmark	Denmark
Nykredit	Denmark
Sydbank	Denmark
Bank of China (Hong Kong)	Hong Kong
Bank of East Asia	Hong Kong
Hang Seng Bank	Hong Kong
Standard Chartered Hong Kong	Hong Kong
The Hongkong and Shanghai Banking Corporation	Hong Kong
Intesa Sanpaolo	Italy
Monte dei Paschi di Siena	Italy
Kommunalbanken	Norway
Nordea Bank Norge ASA	Norway
Santander Group	Spain
SEB	Sweden
Svenska Handelsbanken	Sweden
Swedbank	Sweden
Nationwide Building Society	United Kingdom
Santander UK	United Kingdom
Standard Chartered Bank	United Kingdom
The Co-operative Bank	United Kingdom
Ally Financial	USA
American Express	USA
BB&T	USA
BBVA Compass	USA
BMO Financial Corp.	USA
Capital One Financial	USA
Comerica	USA
Discover Financial Services	USA
Fifth Third Bank	USA
HSBC North America Holdings	USA
Huntington Bancshares	USA
KeyCorp	USA
M&T Bank	USA
MetLife	USA
Northern Trust	USA
PNC Financial Services	USA
RBS Citizens Financial Group	USA
Regions Financial	USA
Santander Holdings USA	USA
SunTrust Banks	USA
U.S. Bancorp	USA
UnionBanCal	USA
Zions	USA

FINVENTURES CONSULTANTS

Listings for, software houses, consultants and analysts specializing in FinTech business and financial IT.

FINVENTURES SCHOLARS (PARTIAL COUNTRY LIST)

Listings for institutes of higher education that are focusing on banking including leading professors' names and their banking school's Web addresses.

Antwerp management school	Antwerp	Belgium
Artesis Hogeschool	Antwerp	Belgium
Flanders Business School	Antwerp	Belgium
Karel de Grote-Hogeschool	Antwerp	Belgium
Plantijn Hogeschool	Antwerp	Belgium
Universiteit Antwerpen	Antwerp	Belgium
Katholieke Hogeschool	Bruges	Belgium
Hogeschool West-Vlaanderen	Bruges-Kortrijk	Belgium
Brugge Business School	Brugge	Belgium
College of Europe	Brugge	Belgium
Boston University	Brussels	Belgium
DULBEA	Brussels	Belgium
EHSAL	Brussels	Belgium
EHSAL Management School (EMS)	Brussels	Belgium
Erasmushogeschool	Brussels	Belgium
Europe Innovation Business School (EIUBS)	Brussels	Belgium
European Business School (EBSB)	Brussels	Belgium
Hogeschool-Universiteit Brussel (HUB)	Brussels	Belgium
ICHEC	Brussels	Belgium
ICHECH	Brussels	Belgium
Solvay	Brussels	Belgium
Solvay	Brussels	Belgium
Université libre de Bruxelles	Brussels	Belgium
Vrije Universiteit Brussel	Brussels	Belgium
VU Brussel	Elsene	Belgium
Artevelde	Ghent	Belgium
UGent	Ghent	Belgium
Universiteit Gent	Ghent	Belgium
Vlerick	Ghent	Belgium
Hogeschool Gent	Ghent-Aalst-Melle	Belgium
United International Business School (UIBS)	Ghent-Antwerp-Brussels	Belgium
Universiteit Hasselt	Hasselt	Belgium
KATHO	Kortrijk	Belgium
Katholieke Universiteit Leuven	Leuven	Belgium
KU Leuven	Leuven	Belgium
HEC Management School - University of Liège	Liège	Belgium
Universiteit Luik	Liège	Belgium
Louvain School of Management	Louvain-la-Neuve	Belgium
Universiteit Mons	Mons	Belgium
Universiteit Namen	Namur	Belgium
Sacred Heart University	Luxembourg	Luxembourg
Universteit Luxemburg	Luxembourg	Luxembourg
Amsterdam Business School	Amsterdam	Netherlands
HES School of Economics and Business	Amsterdam	Netherlands
Hogeschool van Amsterdam	Amsterdam	Netherlands
Universiteit Amsterdam	Amsterdam	Netherlands
Vrije Universiteit Amsterdam	Amsterdam	Netherlands
Arhnhem Business School	Arnhem	Netherlands
Hogeschool van Arnhem en Nijmegen	Arnhem	Netherlands
Nyenrode Business Universiteit	Breukelen	Netherlands
Nyenrode University	Breukelen	Netherlands
Business School Netherlands (BSN)	Buren	Netherlands
De Haagse Hogeschool	Den Haag	Netherlands
TSM Business School	Enschede	Netherlands
Hanzehogeschool Groningen	Groningen	Netherlands
International Business school Groningen	Groningen	Netherlands
Universiteit Groningen	Groningen	Netherlands
NCOI Business School	Hilversum	Netherlands
Stenden University of Applied Sciences	Leeuwarden	Netherlands
Webster University	Leiden	Netherlands
Hogeschool Zuyd	Maastricht	Netherlands
Universiteit Maastricht	Maastricht	Netherlands
Radboud Universiteit	Nijmegen	Netherlands
Radboud University	Nijmegen	Netherlands
Erasmus Universiteit	Rotterdam	Netherlands
Hogeschool Inholland	Rotterdam	Netherlands
Rotterdam School of Management	Rotterdam	Netherlands
University of Phoenix	Rotterdam	Netherlands
TiasNimbas	Tilburg	Netherlands
TiasNimbas Business school	Tilburg	Netherlands
Universiteit Tilburg	Tilburg	Netherlands
Hogeschool Utrecht	Utrecht	Netherlands
Universiteit Utrecht School of Economics	Utrecht	Netherlands
Fontys International School of Business Economics	Venlo	Netherlands
Hogeschool Zeeland	Vlissingen	Netherlands
Christelijke Hogeschool Windesheim	Zwolle	Netherlands

FINVENTURES CORPORATE TREASURERS

Listings of Web addresses innovation financial executives directory (CFOs, advanced digital corporate treasurers).

ABB
Absa Capital
Acarate Consulting
AFEX
Agrium Inc.
Air Berlin
AkzoNobel
Albemarle Corporation
Alstom
Altana
Andisa Treasury Solutions
Arup
AstraZeneca
Autoneum
Bayer
BergHind Joseph
BG Group
Bonduelle
Borealis Group
Brady Corporation
Brightstar
Brocade
Brown-Forman Corporation
Campofrio Food Group
CARE USA
Celesio AG
Celio International
Chalhoub Group
Clearstream
Coca-Cola
Danfoss
Dassault Systèmes
Delhaize Group
Demica
DONG Energy
Dow Corning
Eastman Chemical Company
EDF
EDF Polska CUW
Elkem
Ericsson
Etihad Airways
Eurotoll
F. Hoffman-La Roche Ltd.
F. Hoffmann-La Roche
F. Hoffmann-La Roche Ltd
FTA
Gazprom
Grupa ?ywiec
Guardian Industries Corp.
Hanse Orga International
Heidelberg Cement
Heidelberger Druckmaschinen
Henry Schein Inc.
Hewlett Packard
HMY Group
Huawei
Institutional MMFs Association
Intel Treasury
ITV Plc
Joe & the Juice
Johnson Controls
Kraft Foods Russia
Kyriba
Lafarge
Lennox International Inc.
Linmar Coporation
Logica
Long Acre Life
Lufthansa
Mahindra & Mahindra
Merk KGaA
Mettalis
MyTreasury
NEM Energy B.V.
Nissan
Orange
Pirelli
Rand Water
REL
REL Group
Riaan Bartlett
Rio Tinto
Roche
Royal Ahold NV
RTL Group
Salvatore Ferragamo
Sany
SAP AG & Merck KGaA
Schwabe, Ley & Greiner
Sentenial
SGS
SITA
Standard & Poor's Rating Services
Strate
SunGard
SunGard's AvantGard
SWIFT for Corporates
Swissgrid
Thames Water
The Timken Company
Thomas Cook
Treasury Consultant
TreasuryOne
TRW Automotive
UCB
UniCredit
Union Pacific Railroad
USI Holdings Corporation
Vivartia
Weir Group PLC
Willis Group
Willis Towers Watson
Wolseley
Wolseley plc
XRisk
Zachry Industrial

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HEAR
From over 250 excelling global Fintech leaders and founders

MEET
With over 3000 potential partners, customers, investors & advisors

BENEFIT
From on site advisory clinics run by senior market experts

WATCH
An array of product demos from start-ups and large tech companies

INTERACT
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+ 50 COUNTRIES REPRESENTED

+ 200 EXHIBITORS & PARTNERS

+ 250 SPEAKERS

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