# Papers

# Evolving a payments business to meet the demands of a distributed economy

**Tyrone Canaday**

*Received (in revised form): 15th December, 2016*

Protiviti, 888 7th Avenue — 13th Floor, New York City, NY 10019, USA
Tel: +1 212 603 5435; E-mail: tyrone.canaday@protiviti.com

***Tyrone Canaday*** *is a managing director in Protiviti's Financial Services Technology Strategy and Operations practice in New York City. He has over 17 years of experience in the financial services industry with an accomplished career in strategic management, delivery of key transformational initiatives, and top/bottom line solutions to global firms. Previously, he served as chief information officer of a privately-held, independent advisory firm offering a behavioural economic incentives platform. Earlier, Tyrone spent over ten years in strategy and management consulting firms aligning business to technology and operations across functional and organisational boundaries to improve growth and profitability.*

**Abstract**

*Payment services are in the frontline of the ongoing digital technology revolution. Financial technology (FinTech) companies are breaking boundaries and offering services such as digital cash, cognitive systems and distributed ledger technology to offer customers a more streamlined, user-friendly and cost-effective experience. Some traditional financial institutions are partnering with FinTech firms in an effort to be part of the digital revolution rather than be left behind. But such partnerships and experiments with financial technology products and services need to be managed carefully. This article discusses the current and future state of the payments innovation environment, key change drivers, disruptors, and considerations for a strategic transformative journey which balances speed of innovation with risk.*

*Keywords: responsible innovation, transformation strategy, FinTech, risk management, blockchain, open APIs*

*Tyrone Canaday*

## RAPID PACE OF CHANGE IN PAYMENTS TECHNOLOGICAL INNOVATION

Technology is evolving more rapidly than ever before, and this is driving changes in consumer behaviour and expectations as it relates to ease of use and access to services. The pace is expected to accelerate even more in the coming years as preferences towards electronic channels continue to increase and emerging technologies disrupt existing processing models. Against this backdrop, IT can no longer be viewed as a mere cost centre for payment companies and other traditional financial institutions; rather, it must be viewed as the business itself.

The ubiquity of the internet, mobile computing and peer-to-peer technologies have contributed to the high degree of global interconnectedness, which continues to become more widespread and pervasive. Consumer payments are shifting from physical locations to digital channels, with advanced, alternative financial technology companies (FinTechs) threatening to steal market share from established players. As a result, payment organisations are faced with a variety of intricate strategic decisions concerning new opportunities, challenges and risks. In the race to stay competitive, financial institutions are at a crossroads and

Journal of Payments Strategy & Systems
Vol. 11, No. 1 2017, pp. 15–22
© Henry Stewart Publications, 1750-1806

must make a stark decision to evolve to meet the demands of today's distributed economy or risk being left behind. In such a complex environment, IT will play an increasingly prominent and vital role in corporate strategy and must have a seat in the boardroom to balance innovation with risk.

## THE EMERGENCE OF FINTECH IS REDEFINING BUSINESS MODELS

Over the past decade, the FinTech phenomenon has emerged as a transformational catalyst, which is both disrupting business models and enabling innovation at the more customary financial players. Critical business processes such as funds transfer, transaction monitoring, risk analytics and hosting services, have progressively moved from operating within established players to being outsourced to specialty third-parties. This trend has been fueled, in part, to reduce operational costs, ensure high-quality skill competencies around core processes, efficiencies and faster speed to market.

In response, organisations are developing very different businesses, which are dependent on an assessment of their unique operating environments, risk appetite and business drivers. At one end of the spectrum, some organisations view the rise of FinTech companies and emerging technology as a fundamental threat to their core businesses and are taking a more sceptical and protectionist approach towards the adoption of new technologies. At the opposite end, others are embracing innovation fully and are collaborating with FinTech firms to create composite solutions through partnerships that deliver superior customer experiences and provide distinct competitive advantages. Financial institutions that do not contemplate the potential impact to their business model by disruptive new entrants, or that are uninformed and resistant to change, are at a significant disadvantage to their peers. In a worst-case scenario, such companies may be disintermediated and rapidly rendered obsolete.

## ARCHITECTURAL CROSSROADS AND EVOLUTION

In November 2015, Anthony Jenkins, the former chief executive officer of Barclays, commented on how financial services are approaching an 'Uber moment', referring to the entrance of disruptive technologies that dramatically improve the customer experience or create a new experience that did not previously exist.[1] For many traditional financial services firms, the Uber moment has already arrived. Critical decisions need to be made about how organisations can accommodate shifting customer demands and changing preferences, starting with difficult decisions on how legacy architecture is advanced. Financial services institutions that embrace innovation face multi-dimensional challenges, from rigid legacy systems to the need to reform processes, people and distributed relationships, to a nascent regulatory environment, with regulators that are currently defining specific rules, regulations and standards that will provide the guardrails for 'responsible' innovation.

Open application programming interface (API) architectures are a critical component in maximising the speed of innovation because payment companies can publish APIs to expose source code and allow the online ecosystem of developers and FinTech companies externally to enhance product and services or create net new ones. This configuration has powerful crowdsourcing aspects, which not only bring efficiencies and economies of scale to the application development process but also, in parallel, completely redefine the concept of a conventional operating model.

Following on from the Silicon Valley trend of companies such as Facebook and Google where features such as facial recognition and voice-to-text capabilities are

refined internally, then made available to the general public through APIs as elemental building blocks, financial institutions are beginning to offer component-based products and services, perfected in their own environment, then published through APIs to attract new customers and revenue streams.

Additionally, some players are seeking to leverage the distributed ecosystem, including the vast array of data sources, sensors, beacons and microservices, also known as the internet of things (IoT), to create new solutions. For example, Stripe is an online payments company that can integrate and process payment transactions through the internet without the need of a merchant account. Stripe's API enables an innovative distributed payment transfer protocol between entities that is nimble and flexible. This structure allows a greater range of payment participants to interact without having to directly touch existing banking infrastructure.

As firms compete for future market share, either by innovating on their own or through partnering with innovative third parties on this emerging, distributed digital plane, architectural agility that enables speed to market will be a critical success factor.

## MAINTAINING AGILITY OF INNOVATION WHILE MITIGATING THIRD-PARTY RISK

Financial service companies need to innovate quickly, but they must do so in the context of maintaining safety and soundness through responsible business practices. While a recent statement from the Office of the Comptroller of the Currency around responsible innovation has provided some loose guidance, the collaboration between financial services and FinTech firms will be where the proverbial rubber hits the road, and many of these relationships will evolve through trial and error.[2,3] Much of this will occur in 'sandbox' environments, which are essentially quarantined testing environments void of sensitive consumer data. Here, there is opportunity for financial institutions, FinTech companies and regulatory bodies to come together to innovate responsibly and learn from each other in the process. The Consumer Finance Protection Bureau's Catalyst project is one such regulatory-sponsored sandbox, which invites traditional financial institutions and FinTech participants to jointly develop innovative consumer financial products that meet regulatory requirements.[4]

Time will determine whether these structures work effectively enough to align the interests of all parties. Regardless, in cases where financial institutions and FinTech firms seek to collaborate, they should adhere to responsible innovation research and development and third-party risk management practices, including risk management tollgates early in the innovation process with stakeholders from security and privacy, compliance and IT departments as well as the business. Using this risk-aware approach, speed and agility can be maintained, yet remain well controlled.

Unsurprisingly, cyber security is centrally important, as the sharing of sensitive data with FinTech firms within the distributed network poses new questions around ownership of data, customers and liability. Additionally, FinTech companies that perform key business functions for a payment institution, such as funds transfer or cross-border payments, often leverage other third-parties to support their business, so there are elements of fourth-party business continuity risk exposure that need to be identified and managed.

## RESPONSIBLE INNOVATION: VIEWS ON TRANSFORMATIONAL STRATEGY, CHANGE CONSIDERATIONS AND REGULATORY OVERLAY

Responsible innovation requires balancing and integrating a number of internal and external factors and priorities that have

varying impacts and ramifications. In the face of this complex environment, successful companies will define a clear transformational strategy that aligns their corporate goals, customer service objectives, growth targets, brand perception and risk tolerance. With that strategy in place, a well-articulated target-state operating model can then be developed to establish a solid foundation on which to mature.

Critical considerations and implications in operationalising the strategy and target operating environment often include:

- *Prioritised investments in research and development:* Businesses must be willing to transform their operations and establish environments where new technology can be experimented. Employees need an environment that is conducive to innovation where creative ideas around new products and services are accelerated, developed and nurtured. Institutions should establish internal innovation labs or fusion centres where employees and/or FinTech departments operating inside the company can focus on emerging technology and work collaboratively to share ideas and iterate development. Proof of concepts or experiments that show promise may receive further investment to pilot in controlled user groups and settings before releasing products and services to the broader customer base.
- *Move to the cloud:* Institutions must move to the cloud first in order to create a service-oriented or API-centric architecture that allows an organisation to evolve nimbly, increase speed and manage cost. Chief information/technology officers need to put forth a cloud adoption strategy that selects the best configuration for their organisation, and the decision will underpin many critical infrastructure decisions for the future. There are pros and cons to each approach; for example, public clouds allow the highest level of scalability while private clouds are more configurable to a company's specific needs. Hybrid clouds provide best-of-breed benefits but require a high degree of coordination. Once a deployment option is decided upon, the service model (SaaS, PaaS or IaaS) must align to the profile of the business services that will be delivered to ensure security, IT costs, and integration considerations are optimised and can best support the new services provided.
- *Foster a digital culture:* In additional to bold leadership, digital business leaders must establish a change culture within the organisation centred on the importance of innovation. The tone from the top is vital to place key champions in influential roles to drive the change agenda. At times, this may require the organisation to shake up the status quo and attract talent outside of the industry to facilitate the appropriate culture. Execution teams need to be augmented and/or retrained to have the right skills sets and capabilities to execute the never-ending transformation that is the new norm. Effective change management and human capital practices in human resources must be adopted to ensure the right culture is preserved, and processes to attract talent with vital skills and fresh perspectives are in place.
- *Nimble and effective management of risk:* Typically, organisations have siloed and reactive approaches to risk management that are not integrated across first, second and third lines. With new and emerging technology risks born out of innovation, a rapidly changing regulatory landscape and cyber threats, institutions must address the importance of a unified operating model with clear accountability. Business and risk management should implement an integrated model that enables successful anticipation and response to change, and results in informed executive decisions through an aligned organisation. A flexible risk management framework and supporting tools are necessary to optimise performance

and nimbly guide efforts to overcome any obstacles that arise.

- *Deeper customer behavioural data and insights*: Sophisticated collection and analysis of customer data are necessary for financial institutions to develop and tailor products and services that meet individuals' specific, and often changing, needs. Organisations must correlate disparate data sources from different parts of the business to create a single shared warehouse or data lake where business analytics functions. The various lines of business should own the data and ensure processes are in place to govern the quality and map lineage from sources systems down to the databases. Deeper effective data governance must be in place to confirm that data are properly used, protected and managed. Critical data must be identified to allow the creation and tracking of key performance indicators (KPIs) such as net promoter scores and call centre customer interaction data over time.

It is paramount that well aligned and integrated security, business continuity, process, risk management, compliance and audit functions exist to ensure that proper controls are in place to facilitate a safe and sound innovation environment that maintains agility.

## LOOKING TOWARD THE FUTURE

In the payments innovation continuum, change is occurring so rapidly that practitioners need to have tactical, mid-term, and long-term strategies and be quick to modify IT investments as events occur and evolve. In this context, there are three categories of investments to consider: (1) enhancements to existing payment 'rails', including features like Faster Payments; (2) the expansion of payments services into open platforms; and (3) fundamentally disruptive technologies, such as distributed ledger technology and cognitive systems.

### Faster and Instant payments

There are a number of improvements to the existing payments ecosystem that represent opportunities to improve the effectiveness and efficiency of the environment. While these are not transformational in nature, they represent real opportunities to reduce costs and risks with minimal disruption to current operations. These include efforts such as Faster and Instant Payments efforts. Services such as Popmoney that allow the instant delivery of funds through an e-mail address or mobile phone are being offered by many banks to help close the customer expectation gap of real-time payment experiences.

Additionally, with the rise of FinTech, payment companies are being impacted by emerging specialty startups that are also capable of executing payments in manners that are better, faster and cheaper. The first generations of such companies are creating innovative user interfaces to facilitate instant and faster payments but similarly improve the customer experience. This includes firms such as Venmo and PayPal, which are being used to send cash between peers but still depend on the existing rails. In response, practitioners should be taking the opportunity to make incremental changes to their systems, processes and business models to reduce operational cycle times and improve their consumer digital experience across channels. In the USA, initiatives are currently underway where banks can participate in consortia such as clearXchange — a shared platform jointly owned by a number of leading banks that allows instantaneous cash transfers between them.

### Payment ecosystem extensions

Over the past few years, a number of financial service firms have moved towards open architectures and launch services with innovative third parties to develop more advanced product and services. While some banks are looking to extend their ecosystem

to provide banking services through open platforms, the practice is still experimental and practitioners must take caution to monitor associated risks around these structures as they evolve. Progressively thinking, there are banks such as BBVA's Open API, Citi FinTech and Goldman Sach's Digital Bank that are collaborating with FinTech firms such as Dwolla, Braintree and Simple to provide distinct benefits to their customers, such as real-time clearing and settlement of funds, as well as to support an improved customer experience. Open API projects are more widely supported by the regulators in the UK than in the USA, as seen by the recent changes in the Payment Services Directive regulations (PSD2). More generally, however, practitioners need to monitor the regulatory environment, as this will be critical to the development of these products and services going forward. Firms need to be particularly concerned with the security implications associated with granting third parties the authority to utilise their services.

## Disruptive technology

While the tactical changes are underway and the extension of payment capabilities to third parties represent significant change, these dwarf in comparison to the magnitude of disruption that appears on the horizon. Blockchain technology and artificial intelligence offer the potential to disrupt payment business models fundamentally. Artificial intelligence is starting to be applied on aggregated customer data to learn payment transaction behaviours and provide cognitive system capabilities in order to use the data predicatively. Firms will need to monitor trends carefully and rapidly respond to disruptions in the payments value chain that are almost certain to emerge.

Blockchain, the underlying protocol for the digital currency Bitcoin, has received a lot of attention recently for its promise of a next-generation information infrastructure that allows a shared system of record between all participants in real time. This decentralised and distributed electronic ledger promises to reduce, or even eliminate, data and process silos and create transparency across all participants in the system. Speed, reduced cost and strong cryptography are hallmark attributes which have the potential to help transform, streamline and simplify many back-office functions. Transactions are 'digitally signed' by combining public and private keys and applying a mathematical function using strict cryptography rules that must be validated by a consensus of the network. This audit trail makes each transaction that sits on the block immutable and unique, thereby (at least in theory) reducing opportunities for fraud. If its promise is realised, blockchain will cut out intermediates, reduce cost/friction in the environment, and streamline a multitude of business processes.

In a race to get to the front, a number of efforts are underway that use private closed-loop blockchains to test various use cases between banks and other known entities. R3 CEV, one of the most recognised of these efforts, is working with a consortium of over 70 of the largest banks to attempt to redefine the future architecture for financial services through blockchain technology, and has recently made its Corda distributed ledger platform open source.[5] The recent exit of Goldman Sachs, Morgan Stanley and Santander from R3 further cloud the picture, as rival distributed ledgers such as Digital Asset Holdings and others will compete for future blockchain market share.

In the event that blockchain becomes ubiquitous in usage, the ledger platform that is most widely accepted must embody a number of key characteristics which form the basis of an open and distributed payments architecture. Cash movements between parties must have better visibility, especially as it relates to detecting fraudulent transactions. Ideally, the ledgers record the full history of activity where data entries

are immutable. Lastly, all participants on the platform must be authenticated to ensure that parties involved in the payment transactions are valid and monitored.

Additionally, there are potential efficiencies and cost savings that can be derived from this technology, but a number of hurdles are yet to be overcome. Existing payment infrastructures are well entrenched and will not change quickly. Blockchain (currently) has some architectural limitations, such as the time it takes the network to authenticate a transaction, that limit its use cases. Recent breaches at Mt. Gox, DAO and Ethereum call security into question as well as the integrity of a single shared ledger. Last, and probably most importantly, the regulatory environment surrounding blockchain is uncertain. Despite these challenges, however, this technology should not be ignored, due to its disruptive qualities.

Similar to the internet in the 1990s, which transformed business models to adopt e-commerce and new ways of working, cryptocurrencies and blockchain have the potential to disrupt in ways not even imagined. The sheer inertia of various players investing into the technology demands a second look. The winners in a closed-loop blockchain scenario are the blockchain FinTechs and the forward-thinking banks that have already moved to a distributed infrastructure. FinTech firms such as Ethereum and Ripple, which build applications on top of blockchain that dictate rules around crypto-cash movements, will become more influential; meanwhile, payment FinTechs that do not operate on the infrastructure risk becoming superfluous. Digital cash, which is essentially 'programmable money', can act as a container, a rail or a currency all at once, opening up a world of payment possibilities that may generate new revenue streams and ways to grow the top line for visionary companies. Even now, central banks are considering the use of blockchain technology as well as virtual currencies.[6] With an advanced financial infrastructure where the currency that flows across it can behave in accordance with predefined business rules, one could imagine a more cashless society where currency exchanges could be made even more seamless and perhaps even structured in ways to incentivise behaviour. For example, smart electronic self-driving cars could have currency rules pre-programmed to incentivise drivers and pay them based on safe driving practices and the use of renewable energy sources. The retail landscape could see an alternative virtual shopping landscape open up a world of augmented retail payment experiences based on personalised data collected in the internet of things driven through artificial intelligence. With all the potential benefits and efficiencies, customer protection and security in this reality is increasingly challenging and must keep up with the pace of such innovation.

The impact from Brexit and the recent US presidential election is ushering in new administrations and looming financial policy changes are still too early to predict impacts to the global economy and regulatory space. While the US market has experienced a recent boom, long-term volatility could affect the tech sector, where companies that were originally viewed as safe may face new challenges. The future of payment technology appears bright but could hit speed bumps, particularly when it comes to the postures around topics that impact innovation such as automation, immigration and internet neutrality. There are opposing views on how the internet and open platforms should be handled in the future. Some believe skilled IT talent needs to be sourced openly and globally, while others believe talent should be found domestically. Others feel the internet should be operated as a utility, while others believe internet services tiers should exist. The debate on how these pivotal technology issues play out over time and whether the internet remains open or closed will shape how emerging technology evolves, especially

as it relates to blockchain. The downstream effects on FinTech companies, regulation, Wall Street and the global economy remain to be seen. One thing is clear, cyber security around any types of financial exchanges and sensitive information is of the utmost importance and will remain a central concern for regulators and financial institutions. To be successful, driving responsible innovation in this climate will require more collaboration and an effective balancing of risk management and agility.

## References


(1) Jenkins, A. (2015) 'Approaching the "Uber moment" in financial services: how technology will radically disrupt the sector', available at: https://www.chathamhouse.org/event/approaching-uber-moment-financial-services-how-technology-will-radically-disrupt-sector (accessed 13th December, 2016).

(2) Office of the Comptroller of the Currency (2016) 'Supporting responsible innovation in the federal banking system: an OCC perspective', March, available at: http://www.occ.gov/publications/publications-by-type/other-publications-reports/pub-responsible-innovation-banking-system-occ-perspective.pdf (accessed 28th November, 2016).

(3) Office of the Comptroller of the Currency (2016) 'Recommendations and decisions for implementing a responsible innovation framework', October, available at: https://www.occ.gov/topics/bank-operations/innovation/recommendations-decisions-for-implementing-a-responsible-innovation-framework.pdf (accessed 28th November, 2016).

(4) Consumer Financial Protection Bureau, Project Catalyst, available at: http://www.consumerfinance.gov/about-us/project-catalyst/ (accessed 3rd November, 2016).

(5) R3 (2016) 'R3 offers global developer community open source access to Corda distributed ledger platform', 30th November, available at: http://www.r3cev.com/press/2016/11/30/4z3tvor7so1ccizi1cw0uwtz8ipa0v (accessed 30th November, 2016).

(6) Skingsley, C. (2016) 'Should the Riksbank issue e-krona?', paper presented at FinTech Stockholm, Stockholm, 16th November, available at: http://www.bis.org/review/r161128a.pdf (accessed 1st December, 2016).