

PAYMENTS DIRECTION

2017 Environmental scan report

Developments in the global payments landscape

August 2017

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Foreword

Welcome to our 2017 scan of what's happening globally in the world of payments. This new environmental scan builds on the work we have been doing over the past couple of years to identify the trends and influences likely to impact the New Zealand payments ecosystem over the next decade.

Two years on from our first environmental scan, it's interesting to note the themes identified in 2015 are just as relevant today as they were two years ago, but not because there's been a lack of change in the ecosystem. The last two years have seen a significant acceleration of change, a trend which we expect to continue. In particular, we've seen an acceleration in the rise of the Internet of Things (IoT) and the application programming interface (API) economy, a surge in real-time payment platforms, increased payments related regulatory and central bank action, and heightened awareness of payments security risks.

The 2017 findings reinforce one of the central messages from our earlier work - the speed at which our industry continues to be transformed. Given the rate of transformation, keeping abreast of how trends and influences are developing, and rising to the challenge of this evolving payments environment, should be top of the agenda for all payments stakeholders and the industry.

Staying up to date with global developments is particularly important for our strategic initiative Payments Direction, which is dedicated to better understanding the evolving future of payments. Through Payments Direction we are working collaboratively with the industry to identify what needs to be done to contribute to and prepare for that future. The findings from our 2017 scan reinforces the work we are currently doing in Payments Direction is focusing on the right areas.

We will continue to conduct these scans to inform the work that we do and decisions we make. I encourage you to consider the findings in this report and what they mean for our industry and your business.



Steve Wiggins
Chief Executive
Payments NZ

The background features a grid of squares, some of which are raised to create a 3D effect. The top half of the image is white, and the bottom half is blue. The word "Introduction" is centered in the blue section.

Introduction

Background

This *2017 Environmental scan* is the latest in a series of Payments NZ reports which examine the trends and influences impacting our payments ecosystem, now and into the future.

In 2015 we conducted an environmental scan which identified five key themes we believed would shape New Zealand's payments ecosystem over the next decade. Those five themes were:

1. Payments are increasingly continuous and international in orientation.
2. Payments are increasingly faster, more mobile, more informative and linked across the value chain.
3. Payments infrastructure refreshes and renewals are widespread and arise for a number of reasons.
4. Financial services and payments regulation is expanding and aiming to produce more inclusive and resilient systems.
5. Payment associations face rising expectations.

Then in 2016, we carried out a high-level refresh of the 2015 scan to confirm our research fact base was up to date and that our initial scan remained directionally correct. That refresh confirmed the currency of our 2015 findings. It also identified that the following areas had grown in significance and visibility:

- **Distributed ledger technologies**
These were beginning to be used to address known pain points in payments and more widely in the financial services industry.
- **Digital security and identity management**
New approaches were being developed to manage security and identity in the digital world.
- **Broadening ecosystem / broadening regulation**
Regulatory models for payments were beginning to change to accommodate an increasingly complex and varied ecosystem.
- **Technology access and multi-faceted interoperability**
Regulators, incumbents and payment associations were starting to evaluate the payments systems implications of non-standard technology deployments and third-party access to payment system information.
- **Integrated and embedded payments**
Payments were beginning to be increasingly integrated with and embedded in a wide range of technologies used by consumers.

In 2017 we returned to our core research material to see to what extent our 2015 and 2016 findings might have changed. We were encouraged to discover the five key themes from 2015 are just as relevant today as they were when we completed our initial research and the areas we identified in 2016 as growing in significance continue to be of influence. We have also identified some important shifts of emphasis within each of the five initial themes. This is to be expected as the payments ecosystem responds to the most dominant pressures at any given time.

While our 2015 work remains on point, our 2017 research has identified a sixth critical new theme: Payments security and authentication is a key concern. Given the rapid evolution of consumer behaviour, technology, and the security landscape, our expectation is this theme will continue to be of growing importance in years to come.

In the following sections, we explore each of the six themes, looking at global activity and the factors that drive our theme conclusions for 2017.

2017 theme summary



Theme 1. Payments are increasingly continuous and international in orientation

The expectation that payments will be 'always on', irrespective of geographic location, is now very much central to consumer expectations. In 2017, this theme rests on three key areas:

- **Efficiency improvements:** these include reducing points of friction for cross border payments, which means geographical distance is a decreasing factor when transferring value. The flow of funds is becoming faster, and increasingly visible and traceable.
- **Development of new alternatives:** new methods of cross border payments, both traditional and non-traditional are being deployed.
- **Service availability:** payment systems are expanding their operating hours, or new systems are being developed to meet 24/7 expectations.



Theme 2: Payments are increasingly faster, more mobile, more informative and linked across the value chain

A new area of emphasis within this theme, is the emergence of integrated payments, where the payment is embedded in a host of daily interactions and activities. In 2017, this theme rests on five key areas:

- **Integrated payments:** payments are becoming increasingly integrated into other activities, more automated, and are reducing points of friction with consumers. In some situations, payments are almost 'invisible' from a consumer perspective. This integration is further enhanced by a continued focus on making payments both faster and more mobile.
- **Faster:** the end-to-end speed of payments is increasing, and there appears to be a mass-movement towards real-time payment capabilities.
- **Mobile:** payments are becoming more mobile, mirroring growing consumer mobility and device availability.
- **Informative payments:** the digitisation of payments is enabling more information to be exchanged along with the payment, allowing information based value propositions to emerge.
- **Value chain:** payments processes and related information are increasingly integrated with the wider value chain.



Theme 3: Payments infrastructure refreshes and renewals are widespread and arise for a number of reasons

Infrastructure refreshes and renewals continue to be widespread, with enhancements to the service availability of existing systems and an acceleration in the adoption of real time functionality at the forefront. In 2017, most jurisdictions are undergoing major infrastructure improvements, falling into one of three categories:

- **Redesign:** significant enhancement of existing bulk electronic and high value systems.
- **Replace:** total replacement of existing systems with new systems.
- **New Real Time Payment (RTP) infrastructures:** new RTP systems are being added, sometimes in conjunction with the redesign or replacement of bulk electronic and high value systems.

Five key attributes are common to the improvements underway across multiple jurisdictions: more open access; improved functionality; improved interoperability; improved timeliness; and enhanced risk management.



Theme 4: Financial services and payments regulation is expanding, and aiming to produce more inclusive and resilient systems

The regulatory footprint continues to expand at pace. In some instances, the objective is to improve the resilience of payments infrastructures, to reduce risks and to respond to safety and security threats. In other instances, regulatory action is oriented towards setting the preconditions for greater innovation and competition. In 2017, this theme rests on five key areas:

- **Financial stability:** increasing the resilience of key payments infrastructures, and decreasing systemic risks.
- **Safety and security:** adapting to ever-evolving safety and security threats by introducing new regulations and by working alongside businesses operating in the regtech space.
- **Modernisation and innovation enablement:** re-vamping and renewing critical infrastructures and ensuring the right conditions are in place to support innovation.
- **Competition:** expanding into new areas and also tightening existing competition regulations, in the face of more complex and diverse payments market places.
- **Expanding regulatory coverage:** evolving core payment systems and regulatory roles, to cover new non-traditional payments stakeholders and methods of exchanging value.



Theme 5: Payments associations face rising expectations

Payment associations continue to grapple with expanding expectations. Increasingly, those expectations require payment associations to develop a range of new and different responses. This influences the breadth and depth of the issues associations need to focus on. In 2017, this theme rests on four key areas:

- **Issues and focus:** regulators influencing the issues that payment associations focus on.
- **Roadmaps:** the development of national payments roadmaps.
- **Stakeholder proliferation:** a broader and more varied range of stakeholders to interface with.
- **Standardisation:** a drive for standardisation across a wider range of payments matters.



Theme 6: Payments security and authentication is a key concern

The safety and security of payments has always been important. Ensuring confidence in the payments process, in the face of a new and rapidly changing set of risks, is now a critical issue for all organisations in the payments ecosystem. In 2017, this theme rests on four key areas:

- **Customers' security concerns:** customer concern about the impact of fraud on online commerce continue to be significant.
- **Components of security and authentication:** there is an increasing awareness that the components of security and authentication are more complex than ever, with this complexity spawning new sources of risk.
- **Emerging payments security technology:** new technologies are opening ways to deliver enhanced security and authentication solutions.
- **An array of security related initiatives around the world:** security and authentication are increasingly seen as pan jurisdiction issues.

In many respects, our 2017 theme conclusions show the trends and influences first identified in 2015 are now more evident than ever. Our 2017 research has also identified the following important developments and shifts in points of emphasis within the themes:

- The growth of the Internet of Things (IoT) and its related and enabling technologies.
- The rise of the application programming interface (API) economy.
- An increased emphasis on the importance of international standards.
- The power of rapidly shifting consumer and market expectations, driven in particular by the proliferation of mobile devices.
- Ever faster payments, including a surge of real-time payment platforms being developed.
- A more complex and diverse payments ecosystem membership.
- Growing regulatory and central bank action and thought leadership.
- The automation and integration of payments, embedded into other activities.
- Heightened payments security risks, with new innovative risk management technologies.

You can find out more about these developments within each of these themes on the following pages.

A new theme

Payments security and authentication

In 2017, we have identified a new theme relating to payments security and authentication. Since our 2015 scan was completed, the need to ensure confidence in payments in the face of a new and rapidly changing set of risks has become a critical issue across the payments ecosystem. This more visible emphasis on security is driven by the increasingly varied way we make and receive payments and by a new range of security related initiatives that are under development across the globe. The elevation of this to being a key theme responds to:

- Customers' security concerns about the impact of fraud on online commerce.
- More complex components of security and authentication, which create new sources of risk, some of which are difficult to anticipate.
- Emerging payments security technology opening new ways to deliver enhanced security and authentication solutions.
- Recognition that security and authentication are increasingly pan-jurisdiction issues.

The growth of the IoT is going to be a powerful enabler of change across the payments ecosystem, but is likely to carry a new set of security risks in several areas. This includes securing all points of interaction, on an end to end basis, against data breaches in the payments process. In the short term, at least, efforts to bolster security and to improve authentication have the potential to adversely impact consumer convenience by adding friction to the payments experience.

The European Payments Council has highlighted early warnings regarding the scale of the potential threats on the horizon. These emanate from, among other things, cloud services, big data and virtual currencies, along with the wide range of current threats from sources that are more familiar such as denial of service attacks, malware and card related fraud.

Several developments are playing out in response. New ways of securing card payments online are being piloted around the world through the use of dynamic verification codes. Biometric functionality is being extended to manage user identity in banking, payments and the wider financial sector. Cybersecurity is now very much an area of focus at both the national level and in the design of international partnerships, especially at the regional trading bloc level. For example, the Australian Payments Plan includes working with the government on the development of a national digital identity framework and on developing cybersecurity strategies. Singapore's new Cybersecurity Strategy is also approaching this issue by including a remit to forge strong international partnerships, with its Association of South East Asian Nations (ASEAN) neighbours to combat cyber threats.

While theme 4, which deals with financial services and payments regulation, also contains examples of regulatory activity to improve the safety and security of electronic payments, security is of no sufficient magnitude to warrant becoming a new standalone theme. It is against that backdrop we conclude that in 2017:

The safety and security of payments has always been important; ensuring confidence in the payments process in the face of a new and rapidly changing set of risks, is now a critical issue for all organisations in the payments ecosystem.

The background is an abstract composition of isometric cubes and rectangular blocks. The top and bottom sections feature white cubes with soft shadows, creating a three-dimensional effect. The middle section is a solid blue band, also filled with isometric cube patterns in varying shades of blue. The text "2017 themes" is centered within this blue band.

2017 themes



Theme 1: Payments are increasingly continuous and international in orientation

2017 theme conclusion and summary

The expectation that payments are 'always on', irrespective of payment scenario, geographical location, or the currency in question, continues to grow. This expectation is driven by, among other things, the rise of cheaper, faster and more accessible technology, the development of global standards, initiatives to streamline costly and risky cross-border transactions, improvements in the availability of existing payment system infrastructures, as well as by the development of new RTP functionality with 24/7 availability.

Scan of global activity and change trends

Introduction

The trend towards continuous and increasingly international payments rests on:

1. **Efficiency improvements:** these include reducing points of friction for cross-border payments, which means geographical distance is a decreasing factor when transferring value. The flow of funds is becoming faster, and increasingly visible and traceable.
2. **Development of new alternatives:** new methods of cross-border payments, both traditional and non-traditional are being deployed.
3. **Service availability:** payment systems are expanding their operating hours, or new systems are being developed to meet 24/7 expectations.

Payments that are increasingly international in orientation

- There is a focus on removing the hurdles associated with international B2B payments, including reducing costs and simplifying processes, to enable members of the value chain to better communicate, exchange data, and to accelerate growth.¹
- In some areas regulation is increasing the regulatory overhead through increased traceability and know your customer requirements.² In other areas regulation is bringing a consumer empowerment perspective to lower the costs of certain payments.³
- Digital payments are enabling more metadata to be sent with the payment across international borders.⁴
- SWIFT's Global Payments Innovation Initiative⁵ is now live, with further enhancements planned during 2017-18. This initiative aims to reduce barriers and to streamline the cross-border payments experience to deliver: same-day use of funds, transparency, predictability of fees, end-

1 *Reading the global payments radar*, 9th edition, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-reading-the-global-payments-radar.pdf>

2 <https://www.economist.com/news/international/21724803-charities-and-poor-migrants-are-among-hardest-hit-crackdown-financial-crime-means>

3 http://ec.europa.eu/newsroom/fisma/item-detail.cfm?item_id=57760&utm_source=fisma_newsroom&utm_medium=Website&utm_campaign=fisma&utm_content=Consumer%20Financial%20Services%20Action%20Plan&lang=en

4 *Reading the global payments radar*, 9th edition, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-reading-the-global-payments-radar.pdf>

5 *SWIFT global payments innovation (gpi), Global banks are working together to make a dramatic change in cross-border payments*, SWIFT. Available at <https://www.swift.com/our-solutions/global-financial-messaging/payments-cash-management/swift-gpi?AKredir=true>

to-end payments tracking, and the transfer of rich payment information.⁶

- While it has been made easier for customers to send money across geographies, many pain points still hamper rapid and inexpensive value transfer.⁷
- International standards are being developed to enable future cross-border efficiencies. For example, the ISO RTP Group, made up of more than 70 stakeholders from 17 countries, is developing ISO 20022 standards tailored specifically for RTP scenarios. The objective of this group is to facilitate cross-border interoperability in the future, by documenting a harmonised and consistent view of ISO 20022 RTP business processes, message components, and data content across multiple markets.⁸

70 stakeholders from 17 countries are developing ISO 20022 standards to facilitate cross-border interoperability.

Development of new alternatives

- Significant effort is being made to identify alternatives to correspondent banking, for cross-border, low-value payments. Initiatives such as pan-European instant payments, are driving efforts to streamline cross-border transactions. In Asia, there is an increased focus on cross-border banking within the ASEAN group of countries.⁹
- New gateways and options are emerging to fulfil unmet needs across untapped industries. This is leading to increased ease in conducting cross-border and cross-industry transactions.¹⁰
- Banks and leading financial institutions are moving from experimentation in blockchain, towards implementation. Blockchain technology is being deployed to help streamline cross-border transactions that can carry high risks and costs. This is to reduce operating costs, to increase visibility and transparency across multiple parties, and to secure real-time settlements.¹¹

Service availability

- There is a global trend towards improving the service availability of payment system infrastructures. For example, Japan's Zengin system is moving from a 5-day operating environment to operate 24/7, 365 days a year by the end of 2018.¹²
- Most new payment systems now have 24/7 availability – this is particularly the case for the majority of new RTP systems.
- In New Zealand, a number of industry participants are working together to consider what extended availability might look like for our market and producing a potential roadmap off the back of those discussions.

24/7 availability: most new payment systems have 24/7 up time to meet the expectation that payments are 'always on'.

6 2016 World Payments Report, Capgemini. Available at: <https://www.worldpaymentsreport.com/>

7 The future of financial services, The World Economic Forum. Available at: http://www3.weforum.org/docs/WEF_The_future_of_financial_services.pdf

8 Real Time Payments Group, www.iso20022.org. Available at: https://www.iso20022.org/payments_rtpg.page

9 2016 World Payments Report, Capgemini. Available at: <https://www.worldpaymentsreport.com/>

10 Reading the global payments radar, 9th edition, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-reading-the-global-payments-radar.pdf>

11 Ibid

12 Net Initiatives Relating to System Development in the Banking Sector Aimed at Promoting Continuous Payment Clearing Innovation. Available at: Zengin-Net Initiatives Relating to System Development in the Banking Sector Aimed at Promoting Continuous Payment Clearing Innovation.

Drivers of change

We identified six drivers of change that underpin our theme conclusion:

1. **Technology advancements:** the rise of cheaper, faster, and more accessible technology has been a powerful change agent.
2. **Standardisation:** standards are being developed to enhance efficiency and to ensure future interoperability.
3. **Customer expectations:** are increasing for all payments – both domestic and cross-border. Customers increasingly expect to be able to easily make payments, irrespective of time, time-zone, location and currency.
4. **Internet enabled global commerce:** e-commerce is reducing barriers to offering products and services in different geographies, and with it, efficient cross-border payment functionalities are required.
5. **Regulations:** international regulatory requirements are continuously being introduced and tightened, particularly for cross-border payments with respect to traceability, transparency and 'know your customer' requirements.
6. **Alternative payment providers:** non-traditional financial providers and fintech companies have identified opportunities to offer solutions with comparative efficiency gains and cost reductions, disrupting traditional approaches. In some cases, new bank/fintech partnerships are being established. New technological approaches are also being deployed, with blockchain being a notable example.

Evolution: Comparison to our 2015 Environmental Scan

The trend towards continuous and international payments is increasingly evident in 2017 than in 2015. This reflects a combination of the lowering cost of technology, the growth of borderless commerce and payment system operators responding to market conditions.



Theme 2: Payments are increasingly faster, more mobile, more informative and linked across the value chain

2017 theme conclusion and summary

Faster, more mobile and more informative payments, which are linked across the value chain, continue to be important in shaping the payments ecosystem of the future. Payments are also increasingly integrated into other activities, with certain types of payments being almost invisible from a consumer perspective. The idea that payments should become faster, more mobile, more informative and linked rests on: rising consumer expectations, the growing ubiquity of smart devices and more accessible consumer technologies, a mass movement to real-time functionality, a drive to improve the timeliness of batch based systems, the digitisation of the supply chain, the impact of the IoT, and a shift towards the API economy.

Scan of global activity and change trends

Introduction

This theme reflects where we are seeing the most activity, change and innovation across the ecosystem. A scan of global activity reveals key developments in five areas:

1. **Integrated payments:** payments are becoming more integrated, more automated, and are reducing points of friction with consumers. In some situations, payments are almost 'invisible' from a consumer perspective. The integration is made more powerful, by a continued focus on making payments both faster and more mobile.
2. **Faster:** the end-to-end speed of payments is increasing, including what appears to be a mass-movement towards real-time payment capabilities.
3. **Mobile:** payments are becoming more mobile, mirroring growing consumer mobility and device availability.
4. **Informative payments:** the digitisation of payments is enabling more information to be exchanged with the payment and allowing information-based value propositions to emerge.
5. **Value chain:** payments processes and related information are increasingly integrated with the wider value chain.

Integrated payments

Payments are more integrated into other activities, increasingly automated, and points of friction with consumers are being dramatically reduced. As a consequence, in some situations, payments are almost 'invisible' from a consumer perspective. In particular:

- There is an emphasis on a less complex and time-consuming customer experience at check-out. Payments innovations allow payments to be made in a single tap or automatically. As more transactions become virtual and automated, more payment processes will become invisible to end customers.¹³
- There is a rapid rise in 'invisible payments', where payment functionality is embedded as part of

¹³ *The future of financial services*, The World Economic Forum. Available at: http://www3.weforum.org/docs/WEF_The_future_of_financial_services.pdf

other processes or apps (e.g. Uber).¹⁴ This is a logical extension of an on-demand economy.

- Most of the innovations are modifying front-end processes to improve the customer and merchant experience, while leaving the underlying payments infrastructure undisrupted.¹⁵
- Payments are starting to be made within social networks, and payment initiation has the potential to head towards a speech-enabled future.¹⁶ That said, there are also concerns that advances in the technology of voice cloning could impact the use of voice biometric software¹⁷ and there remains some uncertainty about how best to optimise the trade-off between convenience and security in payments.

The Internet of Things (IoT) has the potential to make every connected device a vehicle for commerce with the payment integrated and invisible to the consumer.

The impact of the much-heralded IoT is expected to expand over the next decade:

- The IoT should support a multitude of new payment opportunities involving the likes of wearable devices, appliances, cars, and in-home purchase and reorder functionality (such as the Amazon Dash Replenishment Service), and machine-initiated payments (such as a milk reorder sensor in a refrigerator).¹⁸
- In a recent survey by Edgar Dunn, 68% of the respondents indicated the IoT will revolutionise the payments industry because every connected device could become a vehicle for commerce, where the payment will be embedded and invisible to the consumer.¹⁹

Banks are selectively opening up their payments data to third parties through APIs. APIs are being used to further integrate payments with other functions, and to increase the cohesion between different organisations. In particular:

- Banks are exploring how APIs can facilitate access to their services and data, providing plug-and-play solutions. For commercial customers undertaking large volumes of transactions, or large-scale information processing (such as accounts receivables reconciliation), APIs can enable seamless integration of data access into their platforms.²⁰
- The need for API standardisation is growing. Examples of API-related standardisation initiatives include:
 - The comprehensive *API Playbook*, launched by the Association of Banks in Singapore, in conjunction with the Monetary Authority of Singapore. This is a reference guide for identifying and developing APIs, along with the requisite data, information standards and security standards. Singaporean authorities consider APIs a key foundation layer for innovation.²¹
 - Europe's Payment System Directive 2 (PSD2) regulations will require banks to open their customer's data to licenced third parties. The regulations implicitly mandate the use of

14 *Reading the global payments radar*, 9th edition, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-reading-the-global-payments-radar.pdf>

15 *The future of financial services*, The World Economic Forum. Available at: http://www3.weforum.org/docs/WEF_The_future_of_financial_services.pdf

16 *Global Payments 2016: Competing in Open Seas*, Boston Consulting Group. Available at: <https://www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-global-payments-2016-competing-open-seas/>

17 *Imitating people's speech patterns precisely could bring trouble*, The Economist - <http://www.economist.com/news/science-and-technology/21721128-you-took-words-right-out-my-mouth-imitating-peoples-speech-patterns>

18 *Global Payments 2016: Competing in Open Seas*, Boston Consulting Group. Available at: <https://www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-global-payments-2016-competing-open-seas/>

19 *Advanced Payment Report*, 10th edition, 2016, Edgar, Dunn and Co. Available at: https://www.wirecard.com/fileadmin/user_upload/wirecard/market_intelligence/infografiken/Edgar_Dunn_Company_-_2016_Advanced_Payments_Report.pdf

20 Ibid

21 *Finance-as-a-service: API Playbook*, The Association of Banks in Singapore. Available at: <https://abs.org.sg/docs/library/abs-api-playbook.pdf>

APIs, requiring each Account Servicing Payment Service Provider to offer at least one communication interface that is documented and freely available on their website.²²

- In the USA, NACHA has formed an API Standardisation Group to develop their own *API playbook*.²³
- In the UK, the Open Banking Standards Working Group is developing a suite of API standards and specifications.²⁴

APIs have become the foundation layer for innovation in payments with Singapore, Europe, USA and the UK making bold steps in API standardisation.

The rapidly growing Chinese economy provides perhaps the best examples of the strengths and benefits of more integrated payments:

- Ant Financial (which runs Alipay and other financial services) and Tencent (which launched WeChat Pay) dominate the digital payments landscape, having experienced extremely high consumer and business adoption rates. Alipay deserves further mention because of its approach and scale:
 - Alipay is now the world's most popular online payment method. It accounts for 44% of global eWallet spend. Alipay dominates digital payments (in-browser, in-app, and proximity) with about 60% of the market and 450 million active users (three times the number of credit-card holders in China). The dominance of China Singles Day in 2015 was staggering. Alipay cleared \$14 billion worth of payments, which is ten-times larger than the \$1.35 billion spent by US consumers on Cyber Monday, America's biggest online shopping day.²⁵
 - Alipay's success can be attributed to how the payment method is embedded into daily life interactions and activities (sometimes through other apps) and reflects consumer lifestyle choices. Consumers in China use Alipay when booking a taxi, searching for a restaurant, or chatting to friends, and when they want to make a purchase or a peer-to-peer transaction. By contrast, Western consumers are more likely to open their browser to buy goods and use a purpose-built app for money transfers.²⁶

Faster

- There is a continued push to improve the timeliness of payments. According to Payments Canada²⁷, timeliness refers to the duration between the initiation of a payment and the moment the funds are made available (irrevocably) to the recipient.
- Consumer expectations are driving more timely payments, driven by expectations of faster settlement, notifications, and consolidated reporting.²⁸
- The mass movement to RTPs appears to be quickly gaining traction - 35 countries have adopted a form of real-time processing and settlement.²⁹ This is being driven by the growing ubiquity of

22 9 key takeaways from the PSD2 draft regulatory technical standards, [www.Paymenteye.com](http://www.paymenteye.com). Available at <http://www.paymenteye.com/2016/08/22/9-key-takeaways-from-the-psd2-draft-regulatory-technical-standards/>

23 API Standardization Industry Group, NACHA. Available at <https://www.nacha.org/content/api-standardization-industry-group>

24 Open Banking Working Group, Open Data Institute. Available at: <http://theodi.org/open-banking-standard>

25 The Global Payments Report 2016, Worldpay. Available at: <http://www.worldpay.com/global/insight/articles/2016-11/global-payments-report-2016>

26 Retail Payments: Mapping Your Digital Destiny, Boston Consulting Group. Available at: <https://www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-retail-payments-mapping-digital-destiny/>

27 Clearing and Settlement Systems from Around the World: A Qualitative Analysis, Payments Canada. Available at: <https://www.payments.ca/sites/default/files/2016-qualitative-analysis.pdf>

28 Reading the global payments radar, 9th edition, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-reading-the-global-payments-radar.pdf>

29 Ibid

smart devices, the continued growth of e-commerce, as well as innovation in P2P.³⁰

- There is also a clear trend for traditional batch-based clearing systems and high value clearing systems to improve their timeliness:³¹
 - Batch-based systems are increasing their frequency of settlement to reduce risks.
 - There is growing end-user demand for faster funds availability for certain payments and for payment processes that better align with the speed of other business processes.
 - High value systems are expanding their hours of operation to support settlements for other systems that have greater availability.
- Standards are now being developed to support the timeliness of payments. For example, the ISO RTP Group mentioned in theme 1.
- In New Zealand, a recent shift to cleared funds for electronic credits, more frequent sending of payment files, and a best practise guideline of one-hour processing for electronic credits, has reduced the time from when a payment is authorised to when the funds are available in the recipients account. Industry participants are also considering a range of ways payments can be further accelerated on the existing infrastructure.

80% of global consumers have smart phones, driving increased mobility in payments.

Mobile

- The future of mobility is being shaped by four factors:³²
 1. Mobility comes in all shapes and sizes. Almost 80% of global consumers have smart phones, nearly 10% own wearables, more than 50% have tablets, and 7% own all three.
 2. Consumers cannot get enough mobile screen time. 93% of consumers in emerging markets and 78% in developed markets look at their phone within an hour or less of waking up.
 3. Text and instant message solutions are consumer favourites. Globally, consumers check text messages and instant messages first thing in the morning.
 4. Mobile payment usage is high in emerging markets. 47% of emerging market consumers reported using their phones to make in-store payments, compared to 20% of consumers in developed markets.
- The World Economic Forum considers the 'move to mobile' can be explained by: mobile payments, mobile wallets, mobile ordering and payment apps, streamlined payments, location-based payments (geotagging), mobile-based merchant payments, integrated mobile shopping apps, biometrics and location-based identification, and tokenisation standards.³³
- Mobile money solutions are beginning to provide alternatives to traditional value transferring systems by streamlining the intermediating processes. New payments alternatives and e-wallets like Venmo, Apple Pay, Alipay and Ripple have emerged from non-bank competitors, putting pressure on the traditional payments ecosystem and its experiences.³⁴ India's Paytm is also making significant inroads.
- Contactless technologies, driven by mobile-based technology companies such as Apple Pay,

30 Ibid

31 *Clearing and Settlement Systems from Around the World: A Qualitative Analysis*, Payments Canada. Available at: <https://www.payments.ca/sites/default/files/2016-qualitative-analysis.pdf>

32 *Global mobile consumer trends: First edition*, Deloitte. Available at: <https://www2.deloitte.com/global/en/pages/technology-media-and-telecommunications/articles/gx-global-mobile-consumer-trends.html>

33 *The future of financial services*, The World Economic Forum. Available at: http://www3.weforum.org/docs/WEF_The_future_of_financial_services.pdf

34 *Reading the global payments radar*, 9th edition, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-reading-the-global-payments-radar.pdf>

Google Wallet, Samsung Wallet, and Android Pay, are getting some traction both in-store and as low-friction initiatives out of store.³⁵

Informative

- The global move to more informative payments and information-based value propositions continues to grow.
- Technology is enabling new data-driven value propositions. Banks and fintechs are increasingly aiming to deepen relationships and to target growth opportunities by leveraging analytic insights, enhancing the customer experience, and addressing real-time risks. Frictionless experiences are evolving, driven by data and behind the scenes processing. The capturing of richer payments information is a core enabler for these propositions.³⁶
- Support for richer data is enhancing the value provided by payment systems by streamlining processes, enabling advanced analytics, and eliminating the need to reconcile information that currently travels over different systems. A great number of transactions are benefiting from having information exchanged within the payment transaction itself. For example, real-time notification of payment, delivery of an electronic document (e.g. invoice, description of benefits, payroll slip details, tracking number), and the simultaneous integration of supply-chain and payment information into core systems.³⁷
- The analytic insights leveraged from big data have allowed non-banks to make inroads into certain shopping experiences and payment types. Some of these non-banks outpace traditional financial institutions on metrics of trust, innovation and privacy.³⁸

Value chain

- Payments processes and payments related information continues to be increasingly integrated with the wider value chain.
- Banks are providing support in digitising the financial supply chain (from order to reconciliation), which still generally relies on paper and manual processes. E-invoicing and accounting system integration have been two areas of success.³⁹
- Research by Boston Consulting Group revealed that businesses of all sizes believe having basic 'request for payment' email functionality, with a pay button and the ability to receive payment deposit confirmation, would be a significant digital leap forward.⁴⁰
- In New Zealand, industry participants are working together to discuss possible benefits the ISO 20022 messaging standard could deliver for the ecosystem.

35 Ibid

36 Ibid

37 *Advanced Payment Report*, 10th edition, 2016, Edgar, Dunn and Co. Available at: https://www.wirecard.com/fileadmin/user_upload/wirecard/market_intelligence/infografiken/Edgar__Dunn__Company_-_2016_Advanced_Payments_Report.pdf

38 <https://payments.nacha.org/sites/payments.nacha.org/files/files/Harnessing%20the%20Power%20of%20Big%20Data%20to%20Drive%20Payments%20Growth.pdf>

39 *Wholesale Transaction Banking: Leveraging "Fin" and "Tech"*, BCG Perspectives. Available at: <https://www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-wholesale-transaction-banking-leveraging-fin-tech/>

40 *Retail Payments: Mapping Your Digital Destiny*, Boston Consulting Group. Available at: <https://www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-retail-payments-mapping-digital-destiny/>

Drivers of change

We identified two drivers of change that underpin our theme conclusion:

1. **Technological advances:** improvements in cloud computing, sensors, and wireless communication are enabling the IoT. Cloud computing is driving new consumer and merchant value propositions (such as easier financial management and integrated point-of-sale systems). APIs are revolutionising data and service delivery among providers and their customers. In addition, biometrics are enabling increasingly user-friendly authentication, and blockchain technology is increasingly being used to enable transactions.⁴¹
2. **Shifting customer expectations:** people now expect seamless and transparent end-to-end experiences that permit unprecedented levels of ease and convenience in commerce and payments.⁴²

Evolution: Comparison to our 2015 Environmental Scan

The trend towards more mobile, faster and more informative payments is more evident in 2017 than in 2015, with integrated payments emerging as a new point of emphasis. We initially identified this move to integration in our 2016 scan refresh under the banner of 'integrated and embedded payments'.

41 *Global Payments 2016: Competing in Open Seas*, Boston Consulting Group. Available at: <https://www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-global-payments-2016-competing-open-seas/>

42 Ibid



Theme 3: Payments infrastructure refreshes and renewals are widespread and arise for a number of reasons

2017 theme conclusion and summary

Global activity confirms that infrastructure refreshes and renewals continue to be widespread. Significant enhancements to existing systems are taking place at the same time as a mass movement toward real-time infrastructures. The infrastructure refreshes and renewals taking place around the world deliver more open, more functional, and more interoperable systems that allow improved timeliness and risk management. This momentum is underpinned by: technological advancements, the growing ubiquity of smart devices, the actions of central banks, and the need to meet the expectations of consumers, merchants and financial institutions for faster settlement, notifications and posting of funds.

Scan of global activity and change trends

Introduction

Most jurisdictions are undergoing major infrastructure improvements, falling into one of three categories:

1. **Redesign:** significant enhancement of existing bulk electronic and high value systems.
2. **Replace:** total replacement of existing systems with new systems.
3. **New RTP infrastructures:** new RTP systems are being added, sometimes in conjunction with the redesign or replacement of bulk electronic and high value systems.

Settlement before interchange models are the fastest growing bulk payment systems with deployments in Ireland, Russia, Poland, Singapore, Sweden, Denmark and New Zealand.

Five key attributes common to both redesigned existing systems and new systems are:

1. **More open access:** system upgrades and policy changes have been established to enable more direct participation in core payment systems. Systems that promote larger numbers of participants have upgraded and enhanced their risk-management configurations to limit counterparty risk exposures.
2. **Improved functionality:** delivering capability enhancements and improved services for end users.
3. **Improved interoperability:** improved automation, better linkages between high value systems with ancillary retail payment systems and other financial market infrastructures. Adoption of richer and more interoperable data standards, such as ISO 20022, aim to improve straight-through processing.
4. **Timeliness of payments:** demands for more rapid payments and access to funds has led to improvements to bulk electronic payments processing speeds, an extension of operating hours, and has been a key catalyst for new RTP systems.
5. **Risk management:** more same-day and intraday settlement cycles, an increase in 'settlement before interchange' models, and moves to decrease credit risk for retail payments are all apparent.

Countries with historically less developed payments infrastructures are deploying best-practice systems without the constraint of legacy decisions. For example, India is aiming to improve financial inclusion and to migrate consumers from cash to e-payments. The National Payments Corporation of India is launching the Unified Payments Interface (UPI), which will provide an open-architecture payment layer (including APIs), a directory (with simple proxy identifier virtual account addresses), and easy authentication to enable mobile payments, including debit payments.⁴³

Payment processing frequency is on the rise. Sweden has moved to 29 settlements a day. Australia, USA and Singapore have moved to same day settlement. Europe's STEP2 settles 7 times a day and New Zealand has moved to at least hourly settlement.

Redesign of existing systems

- Predominantly a focus on bulk electronic and high value payment systems.
- The redesign of high value systems aims to move higher transaction volumes with less risk, and to support intraday settlement of RTP and bulk electronic systems. The most advanced high value systems aim to be extremely risk-proofed and to allow participants to closely manage transactions, liquidity and credit exposures. For example, Switzerland's SIC system has liquidity reservation tools, advanced prioritisation options, and client specific controls, such as debit caps.
- The redesign of bulk electronic systems is focussed on overcoming the legacy shortcomings of low timeliness (next-day settlement and slow funds availability), low access, and low risk management (as a result of using overnight deferred net settlement without compensating controls).⁴⁴
- Examples of bulk electronic system enhancements include open direct system access, real-time monitoring, automation of messages, more frequent settlements, improving the speed of access to funds, and risk management.⁴⁵
- Traditional automated clearing house models remain the most common model for bulk electronic payments. However, over the last decade, 'settlement before interchange' models have become the fastest growing type of bulk payment systems with deployments in Ireland, Russia, Poland, Singapore, Sweden, Denmark and New Zealand.⁴⁶
- The majority of bulk electronic systems have increased their processing frequency to speed up customer access to funds and to decrease credit risk. For example, Sweden moved to 29 settlements per day. Australia, USA and Singapore moved from overnight to same-day settlements. Europe's STEP2 system settles seven times a day, and New Zealand has moved to at least hourly.⁴⁷
- The Reserve Bank of Australia upgraded their settlement system in preparation to settle low value RTPs. The Reserve Bank of New Zealand (RBNZ) is upgrading its ESAS settlement system.

Replacement of existing systems

- There are some instances of total system replacements, particularly in less developed countries where the same level of legacy constraints are not evident.
- The most comprehensive and ambitious total system replacements have occurred in Singapore⁴⁸

43 *Retail Payments: Mapping Your Digital Destiny*, Boston Consulting Group. Available at: <https://www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-retail-payments-mapping-digital-destiny/>

44 *Clearing and Settlement Systems from Around the World: A Qualitative Analysis*, Payments Canada. Available at: <https://www.payments.ca/sites/default/files/2016-qualitative-analysis.pdf>

45 Ibid

46 Ibid

47 Ibid

48 Fast and Secure Transfers (FAST) – Banking Computer Services (BSC). Available at: <http://www.bcs.sg/Services/Fast>

and China⁴⁹ where both countries have rebuilt entire payments infrastructures to help provide a platform for economic growth.

20 markets are implementing or planning to implement real time processing and settlement systems.

New RTP infrastructures

- The mass movement to real-time appears to now be quickly gaining traction globally. 35 countries have adopted a form of real-time processing and settlement.⁵⁰
- There are at least 20 additional markets implementing, or planning to implement, RTP.⁵¹
- In most cases, RTP development is government led. However, in some cases the initiative originates from within the banking community in response to perceived competitive pressures, e.g. Poland, Singapore and Sweden.
- The move to RTP is driven by an environment where consumers, merchants, and financial institutions expect faster settlement, notifications, and consolidated reporting. The growing ubiquity of smart devices, e-commerce, as well as innovation in P2P, are also significant factors in RTP development.⁵²
- Notable activity includes:
 - Widespread RTP development work in South East Asia, for example Malaysia, Sri Lanka⁵³, Thailand⁵⁴, Philippines and Australia.
 - RTP systems going live in India and China.
 - Payments Canada deciding to evaluate RTP options.
 - The Federal Reserve's decision to establish a Faster Payments Task Force⁵⁵ to provide RTP leadership in the USA (they have already created an effectiveness criterion⁵⁶ to assess potential solutions).
 - The pan-European instant payments system is scheduled to go live in November 2017.
 - Dutch banks are building an entirely new RTP infrastructure.

Drivers of change

We identified three drivers of change that underpin our theme conclusion:

1. **Technology advancements:** this includes digitisation of payments, mobility and interconnectedness, enhanced interoperability and automation, and improvements to computing power, storage and data transfer rates.

49 *Internet Banking Payment System* – Industrial Bank Co. Ltd. Available at: http://www.cib.com.cn/en/minipage/cib_bank/EDM.html

50 *Reading the global payments radar - Scanning for opportunities and potential threats in the payments market*, 9th edition, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-reading-the-global-payments-radar.pdf>

51 *2016 Advanced Payments Report*, Edgar Dunn Company. Available at: https://www.wirecard.com/fileadmin/user_upload/wirecard/market_intelligence/infografiken/Edgar_Dunn_Company_-_2016_Advanced_Payments_Report.pdf

52 *Real-time payments are changing the reality of payments*, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/strategy/us-cons-real-time-payments.pdf>

53 *Common Card & Payment Switch (CCAPS) / LankaPay Common Electronic Fund Transfer Switch (CEFTS)* – LankaClear. Available at: http://lankaclear.com/product_service/34-cefts

54 *VocaLink to develop real-time mobile payments for Thailand* – NFCWorld. Available at: <https://www.nfcworld.com/2015/10/12/338594/vocalink-to-develop-real-time-mobile-payments-for-thailand/>

55 *In Pursuit of a Better Payment System* – Fed Payments Improvements. Available at: <https://fedpaymentsimprovement.org/faster-payments/about-the-task-force/>

56 *Faster Payments Effectiveness Criteria* – Fed Payments Improvements. Available at: <https://fedpaymentsimprovement.org/wp-content/uploads/fptf-payment-criteria.pdf>

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2. **User demands:** including faster payment application and access to funds, multi-channel and ubiquity of payments, security expectations, and needing to make and receive a greater number of international payments.
 3. **Changing regulatory landscape:** public policy and regulatory objectives have fostered infrastructure change due to: a focus on systemic risk oversight, central banks driving innovation and modernisation, and user interests meeting international regulatory standards, such as the Bank of International Settlement's Principles for Financial Market Infrastructures and the growing impact of 'regtech' (the use of technology to build a culture of compliance) to promote improved risk management and compliance outcomes.⁵⁷

Evolution: Comparison to 2015 Environmental Scan

The trend for widespread infrastructure refreshes is largely unchanged between 2015 and 2017, apart from the movement towards real-time infrastructures, which is a point of emphasis now taking on a substantial profile.

⁵⁷ *Regulatory evolution*, Australian Institute of Company Directors magazine April 2017, page 8.



Theme 4: Financial services and payments regulation is expanding, and aiming to produce more inclusive and resilient systems

2017 theme conclusion and summary

The scope and scale of financial services and payments regulation continues to expand at pace. Focussing efforts to improve the resilience of payments infrastructures to reduce risk, respond to safety and security threats, and to spur innovation and competition. Regulators increasingly need relationships with, and greater insights into, organisations previously at the margin of the payments ecosystem. At the same time, regulators are spearheading a revamp of payment system infrastructures to modernise economies, to promote innovation, and to open up the payments ecosystem. All this is unfolding alongside a renewed and strengthened regulatory focus on financial stability and on improving the safety and security of electronic payments.

Scan of global activity and change trends

Introduction

Payments regulation levels continue to increase around the world, with trends categorised into one of five key areas:

1. **Financial stability:** jurisdictions are increasing the resilience of key payments infrastructures, and decreasing systemic risks.
2. **Safety and security:** regulators are adapting to ever-evolving safety and security threats by introducing new regulations and by working alongside businesses operating in the regtech space.
3. **Modernisation and innovation enablement:** re-vamping and renewing critical infrastructures and ensuring the right conditions are in place to support innovation.
4. **Competition:** expanding into new areas and also tightening existing competition regulations in the face of more complex and diverse payments market places.
5. **Expanding regulatory coverage:** regulators are evolving their core payment systems and regulatory roles to cover new non-traditional payments stakeholders and methods of exchanging value.

Financial stability

- Globally, central banks are increasing the resilience and decreasing the risks of clearing and settlement systems by regularly introducing new regulations.
- Regulators are also continuing to strengthen their powers over financial market infrastructures.
- Jurisdictions are introducing locally developed measures as well as regulations that implement the Bank of International Settlements (BIS) clearing and settlement mechanism principles.
- The BIS Committee on Payments and Market Infrastructures completed a peer review assessment in 2016 of the implementation of their principles in jurisdictions around the world. They identified some gaps and shortcomings, particularly with respect to default recovery planning, rules and procedures. Regulatory bodies (e.g. central banks) are now being called on to address these gaps.⁵⁸

⁵⁸ *Implementation monitoring of PFMI: Level 3 assessment – Report on the financial risk management and recovery practices of 10 derivatives CCPs, Bank for International Settlements, Committee on Payments and Market Infrastructures, August 2016. Available at: <http://www.bis.org/cpmi/publ/d148.pdf>*

- The RBNZ is acting consistently with this global trend by focusing on enhancing its oversight powers over critical payment system infrastructures.⁵⁹ Reviewing the scope of its crisis management powers over systemically important infrastructures⁶⁰, and tightening requirements for registered bank's system outsourcing arrangements.⁶¹

Safety and security

- There is a global trend for regulators to introduce regulations, rules and guidelines focussed on improving the safety and security of electronic payments and cybersecurity.
- A selection of payments related regulatory safety and security initiatives from around the world follow:
 - In the Netherlands, banks and the government have created the iDIN online identity authentication scheme, which provides authentication services to e-government agencies and e-commerce service providers.⁶²
 - The Reserve Bank of India has mandated two-factor authentication for all online credit card payments.
 - The European Banking Authority's *Guidelines on the Security of Internet Payments* places particular emphasis on strong customer authentication, and is being progressively complied with by members of the EU.⁶³
 - The EU cybersecurity law requires member countries to establish national frameworks and effective cooperation, and is likely to come into effect late 2018.
 - The European Union's PSD2 has very wide coverage and includes numerous safety and security focussed regulations. These include secure customer authentication requirements, protection of sensitive payments data, and the dynamic linking of authentication codes.⁶⁴
 - The Legal Entity Identifier (LEI) uniquely identifies legal entities in financial transactions. In July 2016, the Committee on Payments and Market Infrastructures recommended all correspondent banks use LEIs and that they be included as additional information in payment messages.⁶⁵
 - In early 2017, the Australian Securities and Investments Commission began a coordinated outreach to companies working in the regtech space to help determine how technology can deliver better regulatory outcomes.⁶⁶

59 *Summary of submissions and final policy proposals on the Consultation Paper: Oversight of Designated Financial Market Infrastructures*, RBNZ, Dec 2015. Available at: <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/financial-market-infrastructure-oversight/regulatory%20developments/summary-of-submissions-and-final-policy-proposals-FMI-oversight-dec-2015.pdf?la=en>

60 *Summary of submissions and final policy proposals on the Consultation Paper: Crisis Management Powers for Systemically Important Financial Market Infrastructures*, RBNZ, August 2016. Available at: <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/financial-market-infrastructure-oversight/2016-08-summary-of%20submissions-on-FMI-crisis-management.pdf?la=en>

61 *BS11: Outsourcing Policy for Registered Banks*, RBNZ, March 2017. Available at: <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Policy-development/Banks/Outsourcing-policy-for-registered-banks/BS11-exposure-draft-for-consultation.pdf?la=en>

62 *Online identification with iDIN*. Available at: <http://www.access-nl.org/about-access/features/news/online-identification-with-idin.aspx>

63 *Guidelines on internet payments security*, European Banking Authority. Available at: <https://www.eba.europa.eu/regulation-and-policy/consumer-protection-and-financial-innovation/guidelines-on-the-security-of-internet-payments>

64 *9 key takeaways from the PSD2 draft regulatory technical standards*, www.Paymenteye.com. Available at: <http://www.paymenteye.com/2016/08/22/9-key-takeaways-from-the-psd2-draft-regulatory-technical-standards/>

65 The Legal Entity Identifier Regulatory Oversight Committee. Available at: <https://www.leiroc.org/>

66 ASIC Regtech Roundtable February 2017.

Modernisation and innovation enablement

- Globally, there are numerous government-led initiatives to revamp payment system infrastructures and requirements to modernise economies and also promote digital innovation. A selection of examples includes:
 - In 2017, Thailand will fully launch its 'National e-Payment Master Plan', which includes using a proxy identifier payment service, a state e-payment system, and promoting acceptance of card and mobile payments at POS.
 - In the United States, the Federal Reserve plans to modernise electronic payments and to push for RTPs.
 - In August 2016, the Singapore Monetary Authority launched its *Singapore Payments Roadmap*⁶⁷ to support the government's 'Smart Nation' strategy. The roadmap includes, amongst other things, developing a central addressing scheme (payments by proxy identifier system) and mobile payments for public transport.
 - In Australia, Europe and Singapore, government has been the driving force behind the move to RTPs.
 - Bank Negara Malaysia (BNM), the Central Bank of Malaysia, recently announced PayNet will be the operator of shared payments infrastructures for the country. The formation of PayNet is aligned with BNM's efforts to ensure payments infrastructures are competitive, efficient, open and innovative to accelerate the nation's migration to electronic payments and to meet the existing and future needs of the economy. PayNet will be jointly owned by BNM and the financial industry. Infrastructure projects that will be spearheaded by PayNet include the establishment of a national addressing database to facilitate payments to recipients using their mobile phone numbers or National Registration Identity Card (NRIC) numbers.⁶⁸

Regulators are focusing on open access in banking and payments, with APIs being the main mechanism for achieving that outcome.

- Regulators are beginning to focus on using new digital capabilities to open access to banking and payments related information and functionality, to both customers and third parties. This is commonly referred to as 'open banking'. Regulators are focusing on open banking to improve transparency, increase competition and to enable innovation. Examples include:
 - PSD2, the most significant open banking initiative in the world, gives licensed third parties access to the customer's account information, subject to customer consent. This access includes: payment initiation, fund availability, account balance, account verification and 'earmarking' of funds for payment. In late 2016, The European Banking Authority published regulatory technical standards⁶⁹ to implement PSD2.
 - In late 2016, the Australia Productivity Commission produced a report on *Data Availability and Use*⁷⁰, which included financial services. When investigating banks, a Parliamentary Committee recommended Deposit Product Providers be forced to provide open access to

67 *Appendix B – Singapore Payments Roadmap Report 2016*. Available at: <http://www.mas.gov.sg/~media/MAS/News%20and%20Publications/Press%20Releases/Singapore%20Payments%20Roadmap%20Report%20%20August%202016.pdf>

68 <https://foreignaffairs.co.nz/2017/05/22/merger-of-myclair-and-meps-strengthening-malaysias-payments-infrastructure-to-accelerate-migration-to-e-payments/>

69 *On the draft Regulatory Technical Standards specifying the requirements on strong customer authentication and common and secure communication under PSD2* – European Banking Authority. Available at: <http://www.eba.europa.eu/documents/10180/1548183/Consultation+Paper+on+draft+RTS+on+SCA+and+CSC+%28EBA-CP-2016-11%29.pdf>
Available at: <http://www.eba.europa.eu/documents/10180/1548183/Consultation+Paper+on+draft+RTS+on+SCA+and+CSC+%28EBA-CP-2016-11%29.pdf>

70 *Data Availability and Use* – Australian Government Productivity Commission. Available at: <http://www.pc.gov.au/inquiries/completed/data-access/draft/data-access-draft.pdf>

customer and small business data by July 2018, facilitated by APIs.⁷¹

- The UK's 'Open Banking' initiative continues to be rolled out, which requires banks to build APIs to allow third parties to access customers' data, with their permission.⁷²
- APIs are the main technological mechanism to achieve 'open banking' regulatory outcomes and are now front and centre of many regulatory developments:
 - The Monetary Authority of Singapore developed a *Finance-as-a-service: API Playbook*⁷³, which sets out the benefits of an API economy and how to develop and govern APIs.
 - Europe's PSD2 implicitly mandates the use of APIs. Each Account Servicing Payment service provider is required to offer at least one communication interface that is documented and freely available on their website.⁷⁴
 - To support the UK's Open Banking regulation, the Open Data Institute is leading the development of API standards, in conjunction with industry partners.⁷⁵

Competition

- Card interchange fee levels continue to be an area of regulatory focus. Two recent examples include:
 - The Reserve Bank of Australia completed a review of payments regulation, which mainly focused on card interchange fees. Recommendations focused on competitive neutrality between system providers, reducing the potential for cross-subsidisation between customer groups and merchant groups, and reducing the debit card interchange fee benchmark.⁷⁶
 - PSD2 includes the introduction of caps on interchange fees, acquirer pricing transparency, the separation of card schemes and processing.
- Competition related regulatory interventions are starting to expand into different areas of payment systems. For example:
 - The UK's Payment Systems Regulator (established in 2015) has a mandate to promote competition. In 2016 that regulator completed two market reviews: one assessing the supply of indirect access⁷⁷, and the other on the supply of and competition in the provision of payment systems infrastructure.⁷⁸
 - The Reserve Bank of Australia is consulting on market access issues with respect to mobile wallet technology, particularly with respect to the provisioning of dual-network cards in mobile wallets.⁷⁹
- In New Zealand, the Ministry of Business, Innovation and Employment (MBIE) consulted on retail payments, with a primary focus on competition in the cards market.⁸⁰

71 *Review of the Four Major Banks: First Report*, House of Representatives Standing Committee on Economics. Available at: http://www.aph.gov.au/Parliamentary_Business/Committees/House/Economics/Four_Major_Banks_Review/Report

72 *Open Banking revolution one step closer*, www.gov.uk. Available at: <https://www.gov.uk/government/news/open-banking-revolution-moves-closer>

73 *ABSMASAPIPlaybook* – Association of Banks In Singapore and Monetary Authority of Singapore. Available at: <http://www.mas.gov.sg/~media/Smart%20Financial%20Centre/API/ABSMASAPIPlaybook.pdf>

74 *9 key takeaways from the PSD2 draft regulatory technical standards*, www.Paymenteye.com. Available at: <http://www.paymenteye.com/2016/08/22/9-key-takeaways-from-the-psd2-draft-regulatory-technical-standards/>

75 *The Open Banking Standard*, The Open Data Institute. Available at: <http://theodi.org/open-banking-standard>

76 *Review of Card Payments Regulation*, Reserve Bank of Australia. Available at: <http://www.rba.gov.au/payments-and-infrastructure/review-of-card-payments-regulation/pdf/review-of-card-payments-regulation-conclusions-paper-2016-05.pdf>

77 *PSR MR15/1.3 - Final report: market review into the supply of indirect access to payment systems* – Financial Conduct Authority, Payments Systems Regulator. Available at: <https://www.psr.org.uk/psr-publications/market-reviews/MR1513-final-report-supply-of-indirect-access-payment-systems>

78 *Market Reviews*, Payment Systems Regulator – Available at: <https://www.psr.org.uk/psr-focus/market-reviews>

79 *Dual-Network Cards and Mobile Wallet Technology: Consultation Paper*, The Reserve Bank of Australia. Available at: <https://www.rba.gov.au/media-releases/2016/mr-16-31.html>

80 *Retail Payment Systems Consultation*, MBIE. Available at: <http://www.mbie.govt.nz/info-services/business/competition-policy/retail-payment-systems>

Expanding regulatory coverage

- As digital innovation and disruption occurs in payments, and more companies compete along the value chain with traditional financial institution payments providers, many jurisdictions are responding by increasing their regulatory coverage.
- Regulatory frameworks for fintechs are beginning to be introduced. For example:
 - The Bank of Japan intends to set up a fintech centre as part of its payments department.
 - The Monetary Authority of Singapore (MAS) has formed a Fintech and Innovation Group⁸¹, which specifically includes payments.
 - Some US federal authorities are preparing a new regulatory framework to supervise innovation by banks, fintechs, and payment firms. The Office of the Comptroller of the Currency published a set of principles to guide a regulatory approach to support responsible innovation in the financial technology sector.⁸²
- Bitcoins and cryptocurrencies are beginning to be regulated. For example:
 - The Financial Action Task Force (FATF) is considering approving, Guidelines for a Risk Based Approach on Virtual Currencies.⁸³ The guidelines will create the first international regulatory framework for virtual currencies.
 - New York's Department of Financial Services has launched a virtual currency regulatory framework⁸⁴ and other US states are considering similar moves.
 - The European Commission is developing regulations over digital currency exchanges and virtual wallet providers.⁸⁵

The RBNZ is enhancing its oversight powers, reviewing the scope of its crisis management powers, and tightening requirements for outsourcing arrangements.

- One emerging regulatory area is 'Open Banking', where payments initiation, processing and information are being opened to customers and third-party providers. (refer to the previous 'modernisation and innovation enablement' section for more information).
- The growth of extraterritorial regulation continues. The OECD's *Common Reporting Standard (CRS)* - the USA's *Foreign Account Tax Compliance Act* sibling - is expected to come into effect soon. The CRS is a single global standard for the exchange of account information. Financial institutions such as banks and other deposit taking institutions, custodial institutions, investment entities, and specified insurance companies are required to report under the CRS. The reported financial account information includes details of the account holder, interest, dividends, account balance or value and other income generated, or payments made, with respect to the account.⁸⁶

Europe's Payment Systems Directive 2 (PSD2)

- PSD2 deserves additional mention as the world's most comprehensive and far reaching piece of payments regulation. PSD2 aims to make the retail banking landscape more open and

81 *MAS' Role in a Smart Financial Centre* – Monetary Authority of Singapore. Available at: <http://www.mas.gov.sg/Singapore-Financial-Centre/Smart-Financial-Centre/MAS-Role.aspx>

82 *Supporting Responsible Innovation in the Federal Banking System*, Office of the Comptroller of Currency. Available at: <https://www OCC.treas.gov/publications/publications-by-type/other-publications-reports/pub-responsible-innovation-banking-system-occ-perspective.pdf>

83 *Guidance-RBA-Virtual-Currencies* – Financial Action Task Force (FATF). Available at: <http://www.fatf-gafi.org/media/fatf/documents/reports/Guidance-RBA-Virtual-Currencies.pdf>

84 *BitLicense Regulatory Framework*, New York State Department of Financial Services. Available at: http://www.dfs.ny.gov/legal/regulations/bitlicense_reg_framework.htm

85 *EBA's Opinion on Proposal to Regulate Virtual Currency Exchanges/Wallets*, www.bitlegal.io. Available at: <https://bitlegal.io/2016/08/12/ebas-opinion-on-proposal-to-regulate-virtual-currency-exchangeswallets/>

86 *Common Reporting Standard*, Australian Taxation Office. Available at: <https://www.ato.gov.au/Business/Large-business/In-detail/Business-bulletins/Articles/Common-Reporting-Standard/>

competitive by enabling new value propositions and business models. Some of the market-facing implications of PSD2 are expected to be:

- Account aggregation. Users will get a consolidated view of their total finances across institutions, enriched with personal financial-management tools.
- Collection of transaction data. Lending institutions with the right analytical capabilities will be able to evaluate credit scores more accurately and to target their loan offers accordingly. They will also be able to offer a raft of new customised services, such as contextual financial advice, push alerts, and loyalty programs.
- Alternative payment initiation services. Third parties will be able to offer options to pull funds directly from a customer's bank account. Combined with faster payments, such services may well become lower-cost alternatives to card payments.
- Ecosystem development. Large cross-industry players, such as e-commerce or messaging giants, will be able to leverage PSD2 to create product ecosystems that build on the main customer relationship to cross-sell various financial services.⁸⁷

Drivers of change

We identified four drivers of change that underpin our theme conclusion:⁸⁸

1. Regulators want to enhance resilience by reducing risks.
2. Regulators are looking to obtain efficiencies from standardisation.
3. Regulators are concerned to improve competition and transparency in the market place.
4. Regulators are using regulatory instruments to enable innovation.

Evolution: Comparison to our 2015 Environmental Scan

The trend for an expanding regulatory footprint is more evident in 2017 than in 2015. Regulatory bodies forming relationships with those previously at the margins of the payments ecosystem is a new point of emphasis.

⁸⁷ *Retail Payments: Mapping Your Digital Destiny*, Boston Consulting Group. Available at: <https://www.bcgperspectives.com/content/articles/financial-institutions-technology-digital-retail-payments-mapping-digital-destiny/>

⁸⁸ *2016 World Payments Report*, Capgemini. Available at: <https://www.worldpaymentsreport.com/>



Theme 5: Payments associations face rising expectations

2017 theme conclusion and summary

In 2017, payment associations continue to be faced with expanding expectations. These expectations require a range of new and different responses in order to influence the breadth and depth of issues those associations focus on. We have identified payment associations that have been assuming a lead role in implementation of regulatory mandated requirements, development of national payment roadmaps, and in certain industry standardisation activities. At the same time, payment associations are also responding to a more diverse group of stakeholders, who require some form of representation in industry level dialogue.

Scan of global activity and change trends

Introduction

Expectations on payment associations continue to rise, with trends evident in four key areas:

1. **Issues and focus:** regulators influencing the issues payment associations focus on.
2. **Roadmaps:** the development of national payments roadmaps.
3. **Stakeholder proliferation:** a broader and more varied range of stakeholders to interface with.
4. **Standardisation:** a drive for standardisation across a wider range of payments matters.

Regulators influencing the issues payment associations focus on

- As described above in Theme 4, payments regulation is expanding – both in terms of its depth (the level of regulatory requirements on a given subject), and its breadth (the range of payments areas being regulated). In turn, this is influencing the issues payment associations are being asked to focus on or perceive they need to focus on.
- There is an emerging trend of payments associations executing regulatory mandated requirements. For example:
 - In Australia, the Australian Payments Network (APN), previously the Australia Payments Clearing Association (APCA), had a key role in the early development of the mandated New Payments Platform.⁸⁹ In addition, APN has a key role in delivering the Australian Payments Plan⁹⁰ agreed by the Australian Payments Council.
 - Payments UK has a key role in developing API standards and a common approach for delivering the mandated Open Banking requirements.⁹¹
 - The delivery of the European Commission's endorsement of RTPs is being led by the European Payments Council, who recently released the SEPA Instant Credit Transfer⁹² rules.

89 *New Payments Platform, Phases 3 & 4 - Design, Build and Test*. Australian Payments Clearing Association. Available at: <http://www.apca.com.au/about-apca>

90 *Australian Payments Plan-December-2015* – Australian Payments Council. Available at: <http://australianpaymentscouncil.com.au/wp-content/uploads/2015/12/Australian-Payments-Plan-December-2015.pdf>

91 *Open Banking Working Group*, Payments UK. Available at: <https://www.paymentsuk.org.uk/policy/european-and-uk-developments/payments-uk-help-ensure-best-outcomes-uk-customers-multi>

92 *SEPA Instant Credit Transfer* - European Payments Council. Available at: <https://www.europeanpaymentscouncil.eu/what-we-do/sepa-instant-credit-transfer>

- In the USA, NACHA is highly involved in progressing the delivery of the adoption of ISO 20022 and RTPs, following the direction set by the Federal Reserve Payments Improvement initiative.⁹³

Payment associations in Australia, the UK, Europe, and the USA have been called on to execute regulatory mandated requirements.

The development of national payment roadmaps

- Payments Canada is leading the 'Modernizing Canada's Payments' initiative and has released an ambitious roadmap⁹⁴ covering the delivery of:
 - A new 24/7 RTP infrastructure which has the ability to pay to proxy identifiers, such as mobile numbers.
 - Changes to the Automated Clearing Settlement System (ACSS) over the near-term to meet new regulatory requirements (prominent designation).
 - A new core clearing and settlement system to replace the Large Value Transfer System (LVTS) and the ACSS.
 - Enhancements to the batch Automated Funds Transfer (AFT) stream, including ISO 20022 and additional exchange windows.
 - Modernisation of the Rules framework.
- The Dutch Payments Association, as a part of their wider national plans, is currently building a new instant payments platform.⁹⁵
- UK Payments launched 'A Vision for World Class Payment Systems' in the UK.⁹⁶ This includes a separate initiative called 'A focus on confirmation of payee for customers making payments'⁹⁷, which aims to introduce confirmation of the payees identity before the payment has been authorised (by potentially leveraging proxy identifier capabilities and APIs).

Broader and more varied range of stakeholders to interface with

Payment associations and allied industry bodies are having to engage with a broader and more varied range of stakeholders. This is in response to a growing number of players in the ecosystem, new risks, and higher demand for modern infrastructures. For example:

- Widening the pool of players: There is a more diverse range of players in the ecosystem, many of whom require some form of representation or a degree of involvement in industry level dialogue. As a result, the membership bases of many associations is increasing, with new tiers of membership being developed to accommodate these new players. For example, Australia's APN now has 121 members. Payments UK (launched June 2015) has almost 100 members, approximately half of which are associate members. Payments NZ's membership programme (launched in October 2015) now has 24 Members, a number of which are not involved with core payments infrastructure delivery.
- Risk management and cybersecurity: Payment associations are looking to take lead roles in managing industry-level activities regarding fraud and payments security. In the USA, NACHA is

93 *Federal Reserve Payments Improvement* – Federal Reserve Bank. Available at: <https://fedpaymentsimprovement.org/>

94 *Modernization: Industry Roadmap and High Level Plan*, Payments Canada. Available at: https://www.payments.ca/sites/default/files/roadmap_whitepaper_en.pdf

95 *Instant Payments; paying real-time, anytime and anywhere*, Dutch Payments Association. Available at: <https://www.betalvereniging.nl/en/giro-based-and-online-payments/instant-payments/>

96 *A vision for World Class Payments in the UK_A focus on Open Access to payment systems for payment providers*, Payments UK. Available at: https://www.paymentsuk.org.uk/sites/default/files/A%20vision%20for%20World%20Class%20Payments%20in%20the%20UK_A%20focus%20on%20Open%20Access%20to%20payment%20systems%20for%20payment%20providers.pdf

97 *REPORT World Class Payments - A focus on Confirmation of Payee*, Payments UK. Available at: <https://www.paymentsuk.org.uk/sites/default/files/REPORT%20World%20Class%20Payments%20-%20A%20focus%20on%20Confirmation%20of%20Payee.pdf>

heavily involved in risk management⁹⁸, including keeping payments safe, and on cybersecurity. The Australian Payments Plan⁹⁹ includes a major focus on payments security, including data security, digital identity, and cybersecurity.

- Infrastructure refresh: Associations are having a key role in payments infrastructure refreshes around the world. The European Payments Council published the *SEPA Instant Credit Transfer Scheme Rulebook*¹⁰⁰ for the new real-time infrastructure, APN had a key role in coordinating the earlier stages of Australia's NPP real-time infrastructure, and Payments Canada¹⁰¹ is leading the creation of a new real-time rail and the total replacement of two existing core payment system infrastructures.

Payments associations have to connect with a broader and more varied group of stakeholders.

Drive for standardisation

Industry standards have been referred to as the DNA of the payment system. While payments associations have always had a key role in the development of these standards, this role is evolving due to:

- The network-based nature of payment and settlement rails. This means industry collaboration is increasingly important to provide seamless connectivity for customers.¹⁰²
- Standards being used to facilitate regulatory and industry objectives, particularly resilience, access and innovation.¹⁰³
- A move towards increased cooperation among financial institutions and other infrastructure providers to set up widely accepted standards¹⁰⁴ along with the globalisation of key standards (e.g. the use of ISO 20022).
- The increasing importance of payments security, e.g. PCI DSS, biometrics, and digital identity, etc.

The breadth of standards associations have to respond to is also growing. For example:

- There has recently been a significant amount of industry-level standardisation activity focusing on APIs. Associations in Singapore (API Playbook¹⁰⁵), the UK (Open Banking Working Group¹⁰⁶), and USA (API Standardisation Group¹⁰⁷) all have key roles in developing API standards. NACHA describes the benefits of API standards as follows: "API standardisation can help improve the safety and transparency of transactions, increase efficiencies and speed of communications, and enhance support of payments

98 *Risk Updates and Resources* – NACHA The Electronic Payments Association. Available at: <https://www.nacha.org/risk>

99 *Australian Payments Plan-December-2015*, Australian Payments Council. Available at: <http://australianpaymentscouncil.com.au/wp-content/uploads/2015/12/Australian-Payments-Plan-December-2015.pdf>

100 *2017 SEPA Instant Credit Transfer Rulebook*, European Payments Council. Available at: <https://www.europeanpaymentscouncil.eu/document-library/rulebooks/2017-sepa-instant-credit-transfer-rulebook>

101 *Modernization: Industry Roadmap and High Level Plan*, Payments Canada. Available at: https://www.payments.ca/sites/default/files/roadmap_whitepaper_en.pdf

102 *The future of financial services*, The World Economic Forum. Available at: http://www3.weforum.org/docs/WEF_The_future_of_financial_services.pdf

103 *Standards – the DNA of the payment system*, Payments UK. Available at: http://www.paymentsuk.org.uk/sites/default/files/Standards_The%20DNA%20of%20the%20payments%20industry.pdf

104 *The future of financial services*, The World Economic Forum. Available at: http://www3.weforum.org/docs/WEF_The_future_of_financial_services.pdf

105 *abs-api-playbook*, Association of Banks Singapore & Monetary Authority of Singapore. Available at: <https://abs.org.sg/docs/library/abs-api-playbook.pdf>

106 *Open Banking Working Group*, Payments UK. Available at: <https://www.paymentsuk.org.uk/policy/european-and-uk-developments/payments-uk-help-ensure-best-outcomes-uk-customers-multi>

107 *API Standardization Industry Group*, NACHA. Available at: <https://www.nacha.org/content/api-standardization-industry-group>

innovations.”¹⁰⁸ In addition, the Australian Payments Council developed principles for data sharing and completed a first step in the consideration of an industry approach to APIs.¹⁰⁹

- The European Payments Council has recently launched a new set of industry rules to operate, join and participate in a standardised proxy look-up service, which will support payments being initiated using proxy identifiers such as mobile phone numbers.¹¹⁰

Payment associations are revisiting how to best create and govern standards. For example:

- Payments UK created a Standards Collaboration Framework, which takes a centralised, joined-up approach to managing technical, operational and business standards-related documentation in a more streamlined fashion, on a single platform.
- Payments Canada recently announced they aim to modernise their rules and standards legal framework to ensure their rules remain relevant in a rapidly evolving ecosystem, reflect current market practices, and achieve the appropriate balance between flexibility and compliance.¹¹¹

Payment standards are also beginning to emerge from non-traditional sources. One notable example can be found in the work of the World Wide Web Consortium (W3C) which is developing standards to make the online payments experience consistent for shoppers regardless of which payment method they use.¹¹²

Drivers of change

We identified three drivers of change that underpin our theme conclusion:

1. To remain relevant, payment associations need to manage a more varied set of stakeholder relationships.
2. The need for greater levels of industry collaboration to provide seamless connectivity and customer experience, with payments associations facilitating aspects of that collaboration.
3. A need to re-examine how best to develop, maintain and govern industry standards, in a rapidly changing technological and competitive environment.

Evolution: Comparison to our 2015 Environmental Scan

The trend for payment associations to face rising expectations is more evident in 2017 when compared to 2015. The recognition that there are a new set of relevant voices to be heard in any industry level dialogue, and the recognition that industry cooperation is increasingly important to provide seamless connectivity for customers, are two developing points of emphasis in 2017.

¹⁰⁸ *API Standardization Industry Group, NACHA*. Available at: <https://www.nacha.org/content/api-standardization-industry-group>

¹⁰⁹ *Australian Payments Council, Annual Review 2016*. Available at: <http://australianpaymentscouncil.com.au/wp-content/uploads/2016/11/Australian-Payments-Council-Annual-Review-2016.pdf>

¹¹⁰ *Rules for operating, joining and participating in the Standardised Proxy Lookup (SPL) service*, European Payments Council. Available at: <http://www.europeanpaymentscouncil.eu/index.cfm/knowledge-bank/epc-documents/rules-for-operating-joining-and-participating-in-the-standardised-proxy-lookup-spl-service/scp2p-018-16-v10-rules-for-operating-joining-and-participating-in-the-spl-service/>

¹¹¹ *Modernization: Industry Roadmap and High Level Plan*, Payments Canada. Available at: https://www.payments.ca/sites/default/files/roadmap_whitepaper_en.pdf

¹¹² *The Global Payments Report 2016*, Worldpay. Available at: <http://www.worldpay.com/global/insight/articles/2016-11/global-payments-report-2016>



Theme 6: Payments security and authentication is a key concern

2017 theme conclusion and summary

The safety and security of payments has always been an important issue. Ensuring confidence in the payments process, in the face of a new and rapidly changing set of risks, is now a critical issue for all organisations in the payments ecosystem. The focus on ensuring confidence in the payments process, responds to the expectation from consumers about security and authentication. It is enabled by new approaches to making payments secure and more tightly coordinated national and pan national strategies and actions.

Scan of global activity and change trends

Introduction

Ensuring the security of payments has always been a priority issue. We have previously identified regulatory actions in support of the safety and security of electronic payments in Theme 4. In 2017 there is evidence of a rapidly growing emphasis on security and authentication, driven by the increasingly varied way we make and receive payments and a new range of security related initiatives that are under development. There are trends evident in the following areas:

1. **Customers' security concerns:** consumers continue to be concerned about the impact of fraud on online commerce.
2. **Components of security and authentication:** there is an increasing awareness that components of security and authentication are more complex than ever, with this complexity creating new sources of risk.
3. **Emerging payments security technology:** new technologies are opening ways to deliver enhanced security and authentication solutions.
4. **An array of security related initiatives around the world:** security and authentication are increasingly seen as pan-jurisdiction issues.

Consumer security concerns

- Consumers expect they will be able to transact securely. That expectation is shared by merchants and financial institutions.¹¹³ For consumers, this remains a key area of concern. For example, 92% of a survey's respondents believe fraud will remain a top concern in the future of online commerce.¹¹⁴
- The financial impact of payments fraud is significant and is increasing; large e-commerce and m-commerce merchants lose 1.47% of revenue, according to the 2016 True Cost of Fraud Study¹¹⁵ (up from 1.32% in 2015).
- Efforts to improve security and to bolster authentication, often run counter to the notion of

¹¹³ *Reading the global payments radar*, 9th edition, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-reading-the-global-payments-radar.pdf>

¹¹⁴ *2016 Advanced Payments Report*, Edgar Dunn Company. Available at: https://www.wirecard.com/fileadmin/user_upload/wirecard/market_intelligence/infografiken/Edgar_Dunn_Company_-_2016_Advanced_Payments_Report.pdf

¹¹⁵ *LexisNexis 2016 True Cost of Fraud*, Nexis Lexis Risk Solutions. Available at: <http://www.lexisnexis.com/risk/insights/true-cost-fraud.aspx>

customer convenience because they pull the payments experience in two different directions.

- As payments become increasingly integrated, the security and authentication issues related to identity verification become further complicated. In response to growing threats, industry players are investing in EMV, biometrics, and real-time analytics to drive innovation in fraud detection.¹¹⁶
- As more electronic products support smart applications linked directly to our payment details (so we can use them to make purchases automatically or at the touch of a button), these devices are increasingly trusted to make purchases for us, which brings new security risks.¹¹⁷

Components of payments security and authentication

- Enhanced security is a critical requirement of payments, particularly for the emerging segment of irrevocable RTPs. The two critical aspects¹¹⁸ to consider are:
 - The user needs to be securely authenticated: robust user authentication is evolving from the enforcement of strong password policies to incorporating a combination of multiple-factor authentication, digital signatures and the use of biometrics (e.g. fingerprints, palm-prints, facial and voice recognition, eye scans, and heart rate).
 - Account credential data needs to be protected: to protect account credentials, a combined use of account aliases, directory services, dynamic tokens, and end-to-end encryption, is becoming the norm to guard against fraud from data breaches.
- For the first time, the European Payments Council published a *Payments Threat Report*.¹¹⁹ The report highlights the range of current threats to payments including denial of service attacks, social engineering and phishing, malware, mobile related attacks, botnets, card related fraud, ATM attacks, and multi-vector attacks. The report also made early warnings on threats related to emerging technologies including cloud services and big data, the IoT, and virtual currencies.
- The use of IoT related technology is expected to bring a new set of payments security risks across four key areas:
 - Certifying connected objects against any tampering.
 - Securing all points of interaction, end-to-end, to avoid data breaches in the payment process.
 - Creating a secure vault that will store payment details and generate tokens.
 - Using appropriate fraud prevention solutions, i.e. biometrics.

Emerging payments security technologies

- New ways for securing card payments online are being piloted across the world. For example, Getin bank in Poland and bPCE in France have both launched pilots for cards with dynamic card verification codes, which replace the static three-digit security code on the back of the card with a changeable code that is altered electronically every hour.¹²⁰
- Other methods to tackle fraud involving device fingerprinting, biometrics, geo locating and behavioural analytics continue to be developed.¹²¹ Biometric authentication functionality is now common on smartphones and is being extended as a means of better managing user identity across a range of products in the financial sector. Examples of biometric developments include:
 - Apple and Samsung biometric authentication measures, with Apple's TouchID, now being incorporated into banking mobile apps.

¹¹⁶ *Reading the global payments radar*, 9th edition, Deloitte. Available at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-reading-the-global-payments-radar.pdf>

¹¹⁷ *2016 World Payments Report*, Capgemini. Available at: <https://www.worldpaymentsreport.com/>

¹¹⁸ *2016 Advanced Payments Report*, Edgar Dunn Company. Available at: https://www.wirecard.com/fileadmin/user_upload/wirecard/market_intelligence/infografiken/Edgar_Dunn_Company_-_2016_Advanced_Payments_Report.pdf

¹¹⁹ *2016 Payment Threats Trends Report*, European Payments Council. Available at: <https://www.europeanpaymentscouncil.eu/document-library/reports/2016-payment-threats-trends-report>

¹²⁰ *2016 Advanced Payments Report*, Edgar Dunn Company. Available at: https://www.wirecard.com/fileadmin/user_upload/wirecard/market_intelligence/infografiken/Edgar_Dunn_Company_-_2016_Advanced_Payments_Report.pdf

¹²¹ Ibid

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- Banks implementing biometrics, including fingerprints and voice recognition, for authentication. USA bank Wells Fargo is piloting a fusion of voice and face biometrics to authenticate customers.¹²²

Security initiatives from around the world

- The Fast iDentity online (FiDo) Alliance, a non-profit organisation involving Google, Visa, Mastercard and PayPal, have published specifications on how to move away from traditional passwords and towards leveraging existing biometric capabilities already available in mobile smartphone devices, such as voice recognition and fingerprint sensors.¹²³
- In the USA, the Federal Financial Institutions Examination Council continues to publish regular online authentication guidelines to reflect the fast-evolving nature of consumer behaviour and security landscapes.¹²⁴
- PSD2 contains a significant adjustment to the guidelines for payment service user authentication. Providers will be required to apply 'strong customer authentication' whenever an electronic payment transaction is initiated by a consumer, and requires the combined implementation of at least two independent authentication elements (multi-factor authentication solutions).
- Banks around the world are beginning to adopt fingerprint technology to authorise payments via smartphones and development is now underway to deploy iris detection in front-facing cameras. Several banks have already introduced voice recognition systems in their telephone banking services to verify customers based on their speech patterns.¹²⁵
- In recognition of the growing threats, the Australian Payments Plan¹²⁶ has a major focus on digital identity, data management, working with the government in the development of a national digital identity framework, and on developing cybersecurity strategies.
- Cybersecurity is increasingly a focus area at a generic country level. For example, Singapore announced its Cybersecurity Strategy¹²⁷, which has four key pillars:
 - Strengthen the resilience of Critical Information Infrastructures.
 - Mobilise businesses and the community to make cyberspace safer, by countering cyber threats, combating cybercrime and protecting personal data.
 - Develop a vibrant cybersecurity ecosystem comprising a skilled workforce, technologically-advanced companies and strong research collaborations.
 - Step up efforts to forge strong international partnerships, given that cyber threats do not respect sovereign boundaries.

Drivers of change

We identified three drivers of change that underpin our theme conclusion:

1. Ecosystem members need to meet growing consumer expectations about security and authentication. Consumers do not expect some payment types to be markedly less secure than others.
2. The availability of new and fresh approaches to deliver secure payments.
3. A growing realisation of the benefits of coordinated national and pan-national action in respect of security and authentication.

¹²² 2016 World Payments Report, Capgemini. Available at: <https://www.worldpaymentsreport.com/>

¹²³ 2016 Advanced Payments Report, Edgar Dunn Company. Available at: https://www.wirecard.com/fileadmin/user_upload/wirecard/market_intelligence/infografiken/Edgar__Dunn__Company_-_2016_Advanced_Payments_Report.pdf

¹²⁴ Ibid

¹²⁵ Ibid

¹²⁶ Australian Payments Plan December 2015, Australian Payments Council. Available at: <http://australianpaymentscouncil.com.au/wp-content/uploads/2015/12/Australian-Payments-Plan-December-2015.pdf>

¹²⁷ Singapore's Cyber Security Strategy, CSA Singapore. Available at: <https://www.csa.gov.sg/news/publications/singapore-cybersecurity-strategy>

The background features a series of concentric circles in shades of gray and white, creating a tunnel-like effect. A solid blue horizontal band crosses the middle of the image. The word "Conclusion" is written in white serif font, centered within the blue band.

Conclusion

We were pleased to discover the original thematic findings in 2015 have been reconfirmed by this year's scan. The addition of a security theme has come about among rising concerns about payments security and authentication, driven by the increasingly innovative and varied ways in which a payment can be made.

Within our six themes, we have highlighted a number of key trends and influences that are evident in the payments system globally:

- The growth of the Internet of Things (IoT) and its related and enabling technologies.
- The rise of the application programming interface (API) economy.
- An increased emphasis on the importance of international standards.
- The power of rapidly shifting consumer and market expectations, driven in particular by the proliferation of mobile devices.
- Ever faster payments, including a surge of real-time payment platforms being developed.
- A more complex and diverse payments ecosystem membership.
- Growing regulatory and central bank action and thought leadership.
- The automation and integration of payments, embedded into other activities.
- Heightened payments security risks, with new innovative risk management technologies.

The scan, and these changing trends and influences, have reinforced what many in the industry will already know: the pace of evolution in payments is rapid and shows no signs of slowing. Keeping across these changing trends and influences is important to us at Payments NZ so that we can remain in the best position to respond to the challenges and opportunities this rapid pace of change provides.

We trust that you have found this report insightful. We produce a refreshed scan every year, and a full scan report (such as this one) every second year. If you have any questions about this report, or the work Payments NZ undertakes, please don't hesitate to get in touch with us by emailing connect@paymentsnz.co.nz.

Glossary

AML/CFT (The Anti-Money Laundering and Countering Financing of Terrorism Act 2009) - is New Zealand legislation that places obligations on New Zealand's financial institutions to detect and deter money laundering and the financing of terrorism.

Cryptocurrencies - are digital currencies that use cryptography to secure the transactions and control the creation of new units. Cryptocurrencies are a subset of alternative currencies, or specifically of digital currencies. Bitcoin is one and probably the best known example of a cryptocurrency.

Fintech - an abbreviation of financial technology. Fintech is a term which describes the intersection of financial services and technology and especially the use of technology to deliver innovation in financial services.

Foreign Account Tax Compliance Act (FATCA) - is USA legislation that aims to reduce tax evasion by US citizen, tax residents, and entities. FATCA requires all foreign financial institutions that are not exempt, including New Zealand financial institutions, to register with the Internal Revenue Service (IRS) and report on US citizens and tax residents who have specified foreign financial assets that exceed certain thresholds.

ISO 20022 - a financial services messaging standard developed within the International Organisation for Standardisation (ISO). ISO 20022 is a single common language for financial communications whatever the business domain, the communication network and the counterparty (other financial institutions, clients, suppliers and market infrastructures).

Members - Members are organisations that have joined the Payments NZ membership programme. There are three different kinds of membership: Infrastructure, Standards and Industry membership - which reflect the different kinds of organisations in the payment ecosystem.

New Payments Platform - The New Payments Platform (NPP) is new infrastructure for Australia's low-value payments. It will provide Australian businesses and consumers with a fast, versatile, data-rich payments system for making their everyday payments.

Payments NZ - includes the Company, Governance Committees and Management (officers and employees)

Payments associations - are those organisations which have a role in the management, governance or self-regulation and oversight of a payments system.

Payments ecosystem - includes payment systems, payments products and people and organisations that make and receive payments

Payments industry - refers to Participants, Members, the Reserve Bank of New Zealand and other relevant stakeholders in the business of payments which will vary from time to time.

Payments system - a payments system consists of the mechanisms - including the institutions, people, rules and technologies - that make the exchange of monetary value possible.

Payment Service Directive (PSD) - Is a directive of the European Commission that provides the legal foundation for the creation of a single, Europe-wide market for payments. PSD was introduced to establish a set of rules applicable to all payment services in the European Union. PSD also provides the legal platform for the Single European Payments Area (SEPA).

Payment Services Directive (PSD2) - is a revised directive on payment services, adopted on 23 July 2013.

Payments value chain - the full range of activities and processes organisations undertake to bring payments products and services and related service offerings from conception to delivery.

Settlement Before Interchange (SBI) - is New Zealand's batch retail financial payment system, administered by Payments NZ, through which SBI Participants bi-laterally interchange and settle transaction files multiple times throughout each business day.

Single Euro Payments Area (SEPA) - is a European banking industry initiative to create a European Single Market for retail payments.

SWIFT - the Society for the Worldwide Interbank Financial Telecommunication – which was founded in Brussels in 1973. SWIFT is a co-operative organisation dedicated to the promotion and development of standardized global interactivity for financial transactions. More than 10,800 banking organisations, securities institutions and corporate customers in over 200 countries exchange millions of standardised financial messages daily via SWIFT.

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