Infosys®
Navigate your next

GLOBAL TRENDS IN THE CARDS AND PAYMENTS INDUSTRY 2020

Infosys® | Knowledge Institute

Infosys® | Knowledge Institute

Contents

Rajneesh Malviya
*Senior Vice President,
Financial Services, Infosys*

Ashok Hegde
*Vice President,
Financial Services, Infosys*

Vijay Anand
*Head, Cards and Payments,
Financial Services, Infosys*

Foreword

New technology and competition from fintechs have rapidly disrupted the financial services industry, especially cards and payments. Payments are increasingly ubiquitous, embedded, standardized, and secure, reducing friction in processing and ultimately transforming the customer experience.

Global Trends in the Cards and Payments Industry 2020 analyzes this new ecosystem of real-time payments, including ways to scale solutions, simplify payments, and monetize data. The report also provides insights on how industry players are transforming their businesses by utilizing technologies such as distributed ledger, cloud, artificial intelligence, machine learning, big data, digital, conversational commerce (e.g., smart speakers), wearables and analytics.

These trends and technologies have profoundly changed the cards and payments industry. With resiliency powered by cloud computing, transaction processing platforms can now handle spikes in traffic and ensure banks stay open 24/7. The rapid growth of cross-border e-commerce and expansion of global operations makes the concept of peak and lean hours in bank IT platforms less relevant. Industry leaders and fintech

startups have used distributed ledger technology to reduce costs and increase reward program interoperability across merchant chains. Such initiatives increase consumer adoption of loyalty programs and brand stickiness.

The rapid adoption of real-time payments has fueled that transformation worldwide, including across borders. With more than 50 real-time payment schemes now live globally, companies are focused on building overlay and value-added services for all segments. Firms are also investigating innovative business models that tap into unmet consumer demand and allow incumbents to fend off disruption by fintech companies. For instance, traditional banks have explored peer-to-peer lending, noncard lending at the point of sale, and escrow services for consumer digital commerce.

The 2020 edition of this report covers these industry trends, and more, which we believe will play out in the next few quarters. We offer this analysis to you to help guide you through cards and payments decisions.

NEW PAYMENTS ECOSYSTEM ON REAL-TIME PAYMENT RAILS

The adoption of domestic and cross-border real-time payments has risen rapidly across the globe. There are 54 real-time payment schemes that are live globally, with many planned in the near future (see Figure 1). Industry estimates project the real-time payment market to grow at a compound annual rate of between 50% and 80% from 2018 to 2023.

Trend 1: Rapid rise of real-time payments

With technological and business advancements, real-time payment schemes are also evolving. The focus of institutions governing real-time payment scheme rules are focused on key tenets, such as:

- Support digital payments and new modes of payment initiation – e-channels, wallets, third-party providers, etc.
- Adopt ISO 20022 message formats for end-to-end payment flows

- Use additional optional services (AOS) to cater to country or region-specific needs
- Use extended remittance information to promote use cases in business-to-business (B2B) payments
- Move from net or deferred settlement mechanisms to real-time settlements
- Enable the use of aliases and addressing services

- Design layered architectures with core settlement layer, overlay services and AOS
- Industry participation in defining the payment message guidelines and overlay services
- Sandbox environment for fintech startups to connect and test real-time payment platforms using APIs

Figure 1. Real-time payment schemes are increasing across the globe

Sweden – BIR
2012

Denmark – Straksclearingen
2014

Poland – Express ELIXIR
2012

Iceland – Greidsluveitan
2001

Czech Republic – RTPE
2018

Norway – Straksbetalinger
2019

South Korea – HOFINET
2011

P27²

SEPA EU¹ – SCT Inst

UK – FPS
2008

Canada

Switzerland – SIC
1987

Hungary

US – RTP
2017

Romania – PlatiInstant
2018

China – IBPS
2010

Japan – Zengin
1973

Turkey – RPS
2012

Taiwan – CIFS
1995

Bahrain – Fawri+
2016

Saudi Arabia
2019

Hong Kong – FPS
2018

Mexico – SPEI
2004

ARPS
(covering 22
Arab countries)

India – IMPS
2010

Vietnam

Cambodia - FAST

Thailand – Prompt Pay
2017

Philippines - InstaPay
2018

Colombia

Sri Lanka – CEFTS
2014

Peru

Ghana – GIP
2016

Kenya – PesaLink
2017

Malaysia - RPP
2018

ASEAN's RTP
(covering 10 countries)

Brazil – SITRAF
2002

Nigeria – NIP
2011

Singapore – FAST
2014

Indonesia - TBD

Chile – TEF
2008

Australia – NPP
2018

South Africa – RTC
2006

New Zealand

¹**SEPA EU Countries (22)** live with **SEPA SCT Inst**- Austria, Belgium, Bulgaria, Croatia, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Portugal, Slovakia, Slovenia, Spain

¹**P27 (4)** Sweden, Norway, Denmark and Finland

Live   Upcoming

Source: Infosys

SWIFT gpi has significantly improved cross-border payments processing across the existing correspondent banking network. SWIFT has done successful trials with gpi and domestic real-time payment schemes for real-time cross-border payments. Apart from the industry initiatives, traditional players and fintech startups also offer real-time payment services. Blockchain-based technology companies like Ripple are offering instant cross-border payment services. The company leverages its advanced blockchain technology RippleNet to reach trusted institutions across the globe. Fintech startups like Zelle, Interac, Transfast and Earthport offer real-time domestic and cross-border payments and have been a huge success with retail and corporate payments (see Figure 2).

Recommendations for real-time payments adoption

Real-time payments provide a platform for institutions to make the user payment experience more valuable, and ensures 24/7 availability and real-time settlement. For institutions, the real value lies in leveraging opportunities to monetize real-time payment rails by developing overlay services. These include P2P payments, request to pay, payment aliases, Confirmation of Payee, liquidity management solutions and cross-border P2P.

Open banking APIs will help unlock the value of real-time payments.

The immediacy factor in real-time payments and the large volumes of data generated require scalable IT systems for processing and storage. This need will be amplified by open banking and indirect participation models. Cloud-based offerings can be considered for varying volumes, lower costs, greater availability and compliance requirements.

The ability to receive or transfer money on a real-time basis requires the existing payment infrastructure to be significantly upgraded. Financial institutions without a significant market share

in payments offerings are most likely to use a targeted approach that will help them meet customer expectations and regulatory demands without completely overhauling their technology. Many of these banks will pursue a solution that will not only coexist with their existing payments infrastructures and comply with the new real-time payments scheme, but also be cost effective.

Partnerships are key for institutions to develop innovative use cases and to have a technology platform that enables the adoption of real-time payments. With a Payments as a service model, technology companies will own a majority of the payments processing

and handle large volumes of the payments data that will be generated.

Solutions for real-time payments

The ubiquitous impact and potential of real-time payments have encouraged most players in the industry to offer services including platform, channels, payment solutions, use cases, routing, connectivity and integration.

Real-time payment solutions powered by the big tech companies are used by financial institutions either as a service or deployed within a cloud-based environment. These solutions

support end-to-end payments processing including connectivity to scheme processing systems. Fintech startups offer P2P, contactless payments and merchant payment solutions by connecting multiple networks and services, or offer their platforms as a service to enable domestic and cross-border real-time payments.

Some of the solutions support specific functions within the whole value chain, such as the channels, liquidity and cash management, personal finance management, sanctions, API connectivity, integration to social media or e-commerce sites, and point-of-sale (POS) capabilities. Big tech companies leverage their leadership position in the

Figure 2. Fintech startups lead in offering real-time payment services

Big tech companies	Fintech startups			Tech giants	Messaging networks	Card networks
• ACI worldwide • Finastra • FIS • Fiserv • ProPay • Temenos • Volante	• BELLIN • Bambora • BillingTree • boon • Briisk • bpc • Buckzy • bunq • Chillr • Checkbook • Curve • DiPocket • Direct Site • Earthport • Enservio • Inpay • Guru • IntegraPay • Interac • Justpay	• Jiffy • Klarna • Ledge • Montran • Moneris • Nets • NYCE • Nubank • Obopay • Ozow • Payment data systems • PayFi • Payoneer • PayPal • PayPie • Payscout • Pelican • Pungle • Quickpay	• Rapyd • Rapid Financial solutions • Real Time Debit • Remitly • Ripple • REPAY • SatoshiPay • Square Cash • Stripe • TransferMate Global Payments • Venmo • Verse • Worldline • Weezzo • Wyndy • Yapstone • ZOOZ • Zelle	• Amazon • Facebook • WeChat • Baidu • Google • Alipay	• SWIFT gpi	• American Express Serve • Visa • Mastercard

Source: Infosys

social media and internet space to promote real-time P2P payments integrated with their chat facilities or as a separate payments app. Credit card networks are acquiring specialized players, and expanding their horizon in real-

time payments; for example, the Visa acquisition of Rambus and Mastercard acquiring the real-time payments unit from the Nets Group. The real-time payments market is crowded with multiple technology providers trying

to fill the gaps left by other players, offering services that enhance the customer experience and leveraging opportunities for monetization.

Trend 2: Real-time cross-border payments

Global trade and e-commerce are driving the demand for quick or real-time settlement of payments, within and across borders, which is at an all-time high. With over 30 countries having their own domestic real-time settlement mechanisms (TCH in the US, NPP in Australia, NAPAS in Vietnam, etc.), there is a need to interlink these domestic clearings and develop a seamless near-real-time cross-border payment experience. SWIFT's gpi platform is moving in this direction.

The movement of people across borders is increasing the transfer of remittances across countries. A 2018 World Bank report highlights that remittance transfers worth US$689 billion were made and these are expected to grow larger. In India, for instance, remittances account for 2.9% of gross domestic product. The huge volume of cross-border remittances is another factor that drives the demand for real-time cross-border payment transfers and settlements. E-commerce is another area where cross-border payments are required. Nearly 15% to 20% of e-commerce transactions are international, as e-commerce marketplaces

operate globally. Firms like Amazon, Uber and Airbnb enable international B2B and C2B payments by giving retail customers and businesses the opportunity to spend and shop across borders.

However, cross-border real-time payments face hurdles to meet fraud risk and regulatory mandates. Cross-border payments involve currency conversion and managing exchange rates, which add to its complexity. Corporate firms and consumers demand greater visibility and transparency while making international payments. To reduce reconciliation errors, businesses are favorably considering a real-time tracking system. Higher infrastructure costs, difficulty in achieving cross-border interoperability and the risk of customer acceptance are some of the factors restricting banks from developing cross-border real-time payments offerings. However, a majority of the banks are yet to collaborate with fintech innovators to make strides in cross-border payments and leverage alternative payment methods offered.

Recommendations for leveraging real-time rails for cross-border payments

Similar to the Nordic banks that have stepped in to create P27, a first-of-its-kind, real-time cross-border payment network, there is an opportunity for global banks to explore options to build similar networks or connect to upcoming networks. Ongoing projects by regional and economic cooperative organizations include the Arab Regional Payment System (ARPS) by the Arab Monetary Fund and the BRICS (Brazil, Russia, India, China, South Africa) payment system. Interoperability and risk assessment are constraints when it comes to settling payments across international borders. The adoption of ISO 20022 by banks globally makes it imperative to send and receive standardized payment messages worldwide. It provides banks with interoperability and the ability to carry richer data and achieve straight-through processing.

The availability of richer data will be key to alleviating challenges faced in fraud management and compliance regulations related to cross-border payments.

These challenges are expected to increase as cross-border payments are made in real time. Banks should leverage AI and ML for sanctions screening and fraud screening mechanisms to enable reliable, smarter and quicker processing of cross-border payments. This would lead to increased straight-through payments, resulting in less manual intervention, and help in bringing down the effective cost of payments. Banks can leverage SWIFT gpi to send funds overseas and benefit from end-to-end tracking, improved service levels and credit confirmation. With the involvement of fintech startups like Ripple in the cross-border space, there is an opportunity for banks to collaborate with fintech companies and leverage their platforms and service offerings to meet client cross-border payment needs.

Real-time cross-border payments can be leveraged to support several use cases in retail and corporate payments. Real-time payments would provide corporations with the ability to request on-the-go payments across borders. This will help reduce credit risk and payment fraud. Global businesses can offer their suppliers and customers better invoicing terms, reducing working capital needs. This increases transparency, as all business stakeholders can track the status of payments in near real time. Cross-border real-time payments can become a game-changer in the travel and tourism industry, which is currently dependent on travel and prepaid cards. With cross-currency real-time payments, travelers can do away with maintaining multiple currency wallets or accounts.
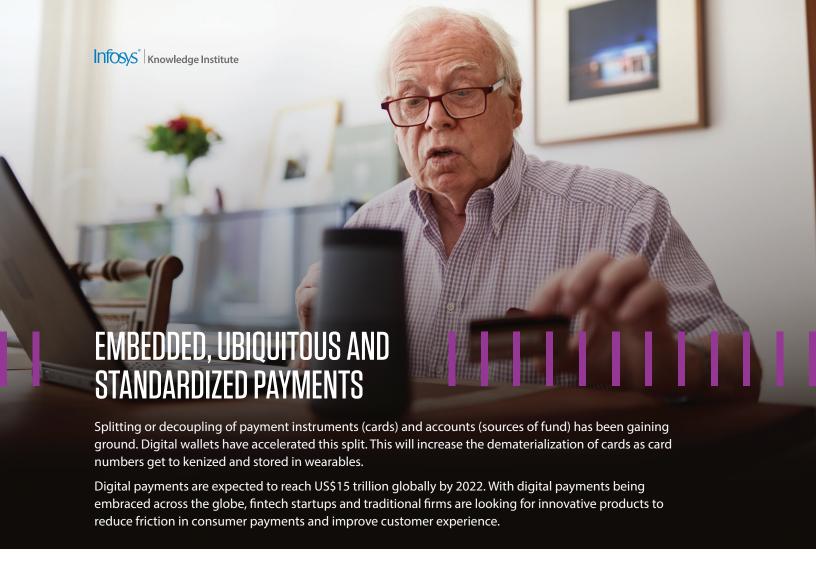
Solutions for real-time cross-border payments

With the increased focus on alternatives to the legacy correspondent banking system and demand for real-time payments across borders, many fintech companies have come up with their own solutions. Ripple provides a cross-border real-time payment network based on distributed ledger technology across more than 40 countries for banks to transfer funds across borders. Ripple recently crossed the 300 clientele mark, which includes banks, financial institutions and payment providers. Other industry players have come up with blockchain-based cross-border payments offerings. Visa B2B connect (based on distributed ledger technology) and IBM Blockchain World Wire (based on blockchain technology and the Stellar protocol) are examples of such initiatives.

SWIFT has come up with its own solution to connect SWIFT gpi with domestic real-time payment clearing systems with the help of domestic banks. With this integration, SWIFT aims to leverage SWIFT gpi, its existing cross-border network, and domestic real-time payment systems to enable banks to send and receive cross-border payments in near real time. The delivery of funds between China and Australia using New Payments Platform (NPP) for domestic clearing in 18 seconds and a trial using Singapore's FAST system wherein a cross-border payment was settled in 13 seconds are examples of cross-border real-time payments using SWIFT gpi.

Visa and Mastercard leverage their card networks for processing push payments into card accounts. Visa Direct and Mastercard MoneySend offerings have been available in the marketplace for quite some time and are targeted toward the domestic as well as cross-border payment needs of consumers and small and midsized businesses. New partnerships are evolving with remittance companies teaming up with the card networks. Remitly has collaborated with Visa Direct to allow its US clients to do real-time cross-border fund transfers to Visa debit cards using a credit push mechanism. Bank of Montreal has teamed up with Mastercard to provide faster global payment services to its clients based on Mastercard's MoneySend service.

EMBEDDED, UBIQUITOUS AND STANDARDIZED PAYMENTS

Splitting or decoupling of payment instruments (cards) and accounts (sources of fund) has been gaining ground. Digital wallets have accelerated this split. This will increase the dematerialization of cards as card numbers get to kenized and stored in wearables.

Digital payments are expected to reach US$15 trillion globally by 2022. With digital payments being embraced across the globe, fintech startups and traditional firms are looking for innovative products to reduce friction in consumer payments and improve customer experience.

Trend 3: Digital payments

Sound-wave-based digital payments

Ultrasound is sound waves with frequencies higher than the upper audible limit of human hearing. It has been used for various needs such as detecting objects, measuring distance, medical imaging and nondestructive testing. Ultrasound waves can be used to process payments at retail outlets or physical points of sale. Mobile devices can use their built-in speaker to transmit sound waves to a receiver, which uses a standard microphone to receive the waves. These sound waves carry transaction details such as merchant name, payment account number and transaction amount. This is a contactless payment method and can be done using a mobile phone. It does not require an internet connection or bluetooth hardware. Software needs to be installed on a mobile device that communicates (using sound waves) with similar software or a tag at a merchant's outlet. The rest of the payment processing is similar to existing industry standards.

Voice (smart speaker)-based digital payments

Tech giants like Google, Amazon and Apple have launched smart speakers with digital assistant capabilities. Smart speakers can receive voice instructions from consumers and execute mundane tasks. Going one step further, Amazon has facilitated payment transactions using Echo (Amazon's smart speaker) and Alexa (Amazon's digital assistant); Alexa can execute the payments using the Amazon Pay wallet tied to the device. An illustration of how a payment is made using Alexa: the user gives a voice instruction to the device asking for a bill to be paid. The device verifies the Amazon Pay wallet balance and asks for the authorization PIN (each Amazon Echo speaker has a PIN for user authentication).

The user provides the credentials via voice instruction. On successful validation of the credentials, payment processing is completed like a normal online transaction. Currently, only low-value transactions are allowed with this method.

Wearable payments

As merchant terminals with contactless payments capabilities have become commonplace, consumers are embracing wearables to fulfill their payment needs. Wearable-based payments are gaining ground in Europe and China. Wearable payment technology works on similar lines to that of near-field communication (NFC) mobile payments. Instead of a mobile device, a customer can use a smartwatch, bracelet, fitness band, ring or any jewelry to pay. The wearable devices have payment credentials embedded in them. They communicate with the merchant POS terminal or other compatible devices and complete the transaction processing in less than a second. Wearables provide enhanced convenience and ease of usage, without compromising the security associated with contactless payments.

Biometrics-enabled digital payments

NFC mobile payments wherein a mobile phone is used to authenticate a user's fingerprint, have made biometrics technology commonplace in retail payments. Biometrics such as a fingerprint, iris or face scan make payments safe, secure and fast, and also

eliminate the need for consumers to remember passwords. Apple Pay popularized the usage of fingerprint authentication for payments. Other biometric methods of authentication such as facial, voice and vein pattern recognition are gaining ground.

Cryptocurrency wallets

Digital wallets that enable storing and transacting using cryptocurrencies like bitcoin are becoming quite popular. In the cryptocurrency wallet, digital currency is stored in the blockchain. The wallet interacts with the blockchain and assists in transacting using the digital currency. The public and private keys are held by the user. The public address is known to the user community and wallet provider. The wallet holder is identified by a public address. When other users transfer digital currency to a public address, the private key on the wallet is used. The wallet authenticates using the public and private keys. On successful authentication, the transaction is processed. Cryptocurrency is stored not in a wallet but on the currency's blockchain. The wallet acts as an interface between the user and the corresponding blockchain.

Recommendations for digital payments

Millennials' and Gen Z's propensity for mobile has led to fast adoption of mobile payments across the globe. Evolving trends in digital payments such as voice-based payments or wearables appear

as innovation of form factors or innovation in ways in which a transaction is initiated. Consumer mindshare is increasingly captured by digital front ends, and the payments service providers may eventually get eclipsed by these digital front ends. The emergence of QR code-based payments in China is a case in an example.

Alipay and TenPay are QR code-based payment providers that dominant digital payments in China. They both leverage consumers' mobile phones to enable a frictionless payment experience. There is no fund stored in the digital wallet and the transaction amount is fetched from the bank account during transaction processing. Alipay and TenPay have expanded their share of consumers' wallets by offering consumer loans, investment advisory services, money market instruments, etc. Due to their dominant market share, they have demoted Chinese banks to only provide value storage rather than financial services. Banks continue to bear the cost of compliance, running bank branches and other operational costs, while digital players have started to eclipse them to the extent that banks may end up being "dumb pipes" in the digital economy.

UPI-based payments have grown at a rapid pace in India, thanks to mobile app offerings from fintech players such as Google Pay, PhonePe and Paytm. The UPI design connects mobile apps from any service provider (fintech startup or bank) to any

bank account. Though banks had launched their own mobile apps for UPI, consumer adoption of apps launched by fintech startups was far higher. This underscores the need for banks to stay focused on digital offerings to stay relevant in the minds of millennials and Gen Z.

Banks can tap into their knowledge of customers' digital preferences (for example, the use of smart speakers) and technology like biometrics to reduce friction in payments processing, improve customer experience, enhance engagement and ensure stickiness. With the amount of data available to banks, they have a bigger opportunity to understand consumers' preferences and financial needs. Insights gained from digital interactions will enable banks to customize their products and launch new offerings to meet the emerging needs of millennials and Gen Z.

Solutions for digital payments

Amazon's Echo-powered Alexa voice command payments are well integrated into Amazon's retail ecosystem. The Google Home speaker, powered by the digital Google Assistant, offers voice-based payment features. Google has teamed up with Walmart to bring thousands of Walmart products into the voice shopping mode. Over the next

couple of years, voice-based payments are expected to gain market share for low-value payments. Offerings such as P2P money transfer using voice commands will heat the market for players such as MoneyGram, PayPal and Venmo.

Atomic wallet, Bread wallet, Mycelium and Exodus are few cryptocurrency wallet offerings available on mobile, desktop and cloud-based formats. In Europe and the US, there is no regulatory bar on dealing with cryptocurrencies. However, in some Asian countries, cryptocurrency trading is not approved, and the evolution of the cryptocurrency wallet is limited in such markets. Regulatory frameworks will continue to a key factor in determining the success of cryptocurrency wallets.

In China, fast-food chain KFC has introduced a facial recognition-based payment system called "Smile to Pay." It links users' faces to their Alipay accounts. Alipay is one of the most widely used digital wallets in China. Users can execute a payment by interacting with a self-service kiosk for payment processing. Mastercard has launched a "selfie-based payment" pilot in Europe that authenticates payment by clicking a selfie instead of entering a password.

ToneTag offers sound-wave-based payment technology to retail merchants. It can work without the internet and payments can be made using only a feature phone. In India, retailers like Shoppers Stop and digital wallets such as MobiKwik leverage ToneTag's offering. Globally, about 400,000 merchants are using this technology, with higher traction seen in the Middle East and Asia. As no internet or NFC or bluetooth hardware is required, it is suitable for usage in geographical areas where internet penetration is low and customers cannot afford smartphones.

Apple Pay transformed the NFC mobile payments market and built itself a unique value proposition in terms of consumer convenience and payments security. The Apple smartwatch enables wearable payments and supports the Apple Pay digital wallet. To enable wider adoption of wearables, players such as Xiaomi, Fitbit and HTC offer payments capability at a reasonable cost for their devices. This has boosted wearable payment usage in markets like China.

Trend 4: ISO 20022 adoption in payments

From low-value retail payments to large global business transactions, financial messaging is the heart of all payment operations. ISO 20022 is a global standard for financial payment messaging that provides a standardized approach and methodology to be used across all payment messages and networks It provides for richer metadata on payment transaction details than do traditional messages used for payment transfer. The XML-based framework of ISO 20022 allows more information to be sent through payment messages, which improves the operational efficiency.

The payments industry currently uses various legacy proprietary messaging formats that limit innovation and collaboration among financial institutions. This also leads to higher infrastructure and operational costs ISO 20022 adoption provides banks and financial institutions with flexibility and accuracy through a syntax-independent and flexible framework. It promotes users creating payment message models that break cross-border barriers and support global business operations.

Recommendations for accelerating ISO 20022 adoption

As various central banks and payment authorities are coming up with regulations on ISO 20022 adoption, banks and financial institutions are working to embrace ISO 20022. SWIFT has projected this transition to occur over a four-year period. This provides financial institutions with sufficient time to prepare and plan for the implementation of ISO 20022. Critical success factors that will help banks adopt this standard seamlessly include:

- Create an impact assessment with a long-term view in mind
- Plan the adoption sequence for various payment schemes
- Ensure that any new payment scheme to be introduced in the market is ISO 20022-based to avoid duplication of efforts
- Plan for implementing the required technology and interface changes
- Educate technical and operations resources on the new messaging format

Coexistence approach – a first step toward ISO 20022 adoption

A structured migration approach that allows a legacy format to be in use while ISO 20022 is leveraged for specific schemes is recommended. The coexistence of message formats enables multiple message formats to be used for various payment schemes. The simplest way to achieve this is by mapping the existing proprietary messaging formats to their equivalent SWIFT MX messages. The mapping can be built using the business logic of the messages at the interface layer. For example, the ISO equivalent of MT101 is Pain.001, while that of MT900 is CAMT.054. An alternative approach is adoption based on message type, and this approach gives flexibility to financial institutions to initially adopt ISO 20022 based on the message type or its attribute.

Participants may choose to migrate to ISO 20022 messages only for some specific business processes in payment processing while retaining their existing legacy message formats for other message types or business processes. For example, migrating only outward payments for settlement to ISO 20022 while continuing to receive payment messages from clearing in proprietary standards. This gives financial institutions the flexibility to divide the payment traffic based on message attributes such as account type and payment type. Banks need to build a set of API libraries for business processes where complex orchestration is present. The API layer can handle the required message translation. Banks with low payment volumes and those that use a limited set of payment schemes can consider transforming their functional flow for ISO 20022 adoption.

Status of payment scheme adoption of ISO 20022

Regulatory boards and SWIFT have started various initiatives to encourage banks and financial institutions to migrate to ISO 20022. SWIFT has come up with the Cross-Border Payments and Reporting initiative to develop global usage guidelines for ISO 20022 adoption. The adoption will gain further momentum due to key initiatives such as the European Payment Council's Single Euro Payments Area (SEPA) offerings, the UK's New Payment System Operator's introduction of the New Payments Architecture and the US Federal Reserve and its clearinghouse's focus on real-time payment initiatives.

ISO 20022 being a standard XML and global messaging format will help banks generate richer structured data. Over time, all segments of financial settlements, from payments to securities, will use ISO 20022 standards, which will improve the efficiency of message communication and optimize the operational and infrastructural costs. The Trace Transformer by Trace Financial and the Swift Funds Migration Accelerator by Volante are examples of service offerings from payment messaging solution providers that enable banks to accelerate their ISO 20022 adoption. Payment gateway providers to various central banks, such as CMA, ProgressSoft and Flywire, have launched offerings for ISO 20022 transformation for their clients.

A report on ISO 20022 migration by SWIFT highlights that most of the domestic systems, including real-time payment systems and high-value real-time gross settlement schemes, have announced plans for migration to ISO 20022. SWIFT expects 80% of high-value payments to be migrated to ISO 20022 by 2023. For cross-border systems, most banks plan to complete MX message adoption by 2023. The study points out that only 25% of the 148 high-value payment systems across the globe have already adopted ISO 20022. However, a widely used set of high-value payment systems are expected to adopt MX-based ISO 20022-compliant payment messages by 2023. These payment systems cumulatively handle 87% of high-value payments globally in terms of payments value. Most European and Asian countries have adopted the MX-based global standard for high-value payments, and the rest of the regions are gearing up as well.

AI- AND ML-LED DIGITAL TRANSFORMATION

Banks are using AI and ML to redefine the customer experience and gain insights from payments data. Natural language processing leverages AI capabilities to convert speech to text and to generate text. Chatbots are increasingly used in cardholder servicing because they can automate the handling of routine customer queries, and allow the customer service representatives to focus on complex servicing requests.

Trend 5: Artificial intelligence and machine learning in cards

Cognitive robotics process automation (RPA) is AI-related technology that enables the banking industry to automate banking processes that involve manual intervention by back-office personnel to pull information from multiple applications or data sources. RPA can be applied to a wide range of use cases in banking including retail branch banking, commercial lending, consumer lending, loan processing, underwriting, anti-money laundering (AML), etc. In the cards industry, RPA has been used in areas such as account opening, collections, dispute management and cardholder servicing. Complex ML algorithms are used for fraud management and anomaly detection in card transaction processing.

Computer vision leverages AI for automatic extraction, analysis and understanding of useful information from images. This helps to review documents related to legal and regulatory compliance.

"Self-driving" banking focuses on automated banking processes that enables bank accounts to "drive themselves." Self-driving banking is expected to evolve to a stage where it can make decisions on behalf of customers based on customer consent and data.

Recommendations for leveraging AI and ML for cards

Rapid improvements in computing power, decline in the cost of computing and storage, availability of abundant data and advances in algorithms have enabled increased adoption of AI and ML. These technologies should be viewed as technology enablers, whose benefits can be fully accrued only if the required methodologies, processes and governance mechanisms are put in place.

Align technology strategy with business goals

Banks need to align their AI and ML technology strategy with an enterprise-level road map of business use cases. A clear definition of use cases and use case prioritization based on expected benefits are prerequisites for any initiative in AI and ML. It is also imperative that the technology strategy be aligned with a bank's game plan for pursuing differentiation or excellence in various domains.

Foster a culture of learning and collaboration

Banks can leverage digital learning platforms to enable a culture of continuous learning in AI and ML for their business and technology teams. A collaborative team of technology experts and business knowledge is essential for successful AI and ML initiatives. Business system analysts can act as the bridge between the technology and the business team. Cross-functional teams working collaboratively are

needed to solve complex business problems. More importantly, insights gained through AI and ML initiatives should be made available in near real time to front-end staff for their decisioning. This ensures these gains are amplified across functional areas, various operational silos and geographical teams.

Focus on processes and methodologies

A clear definition of an enterprisewide data strategy will provide a set of directions to various teams working on AI and ML initiatives. Data governance processes are standard to meet regulatory compliance related to customer data privacy. Using the data lake approach to have a single, consolidated data repository will enable banks to have a 360-degree view of customers, business and processes. Having a common set of tools for data extraction, analysis, insight generation and data visualization will avoid duplication of efforts across multiple teams, business units and geographically spread teams. Well-defined key performance indicators will ensure the objectives of the AI and ML initiatives and expectations of benefits are clearly articulated to the wider teams involved.

Critical success factors in AI and ML initiatives

Cybersecurity

Technology platforms form the core of the banking and payments processing industry. Managing cybersecurity has become

complex with the widespread adoption of digital technologies and the increase in technology complexity. While fraudsters will continue to mount cyberattacks, ensuring platform security is critical given the laws governing customer data privacy and the financial value of insights generated by AI and ML initiatives.

Regulatory compliance

Leveraging AI-powered RegTech solutions enable banks to overcome regulatory compliance challenges. AI and ML enables cost reduction and improves proof of compliance. These initiatives themselves could come under regulatory scrutiny given the regulations in the customer data privacy domain. Data insights gained through data collected or stored in a manner not compliant with regulations and actions arising from those insights would attract regulatory scrutiny. Therefore, a robust data governance model is imperative.

Employee displacement

Nearly half of all banking jobs will be technically and economically doable by AI and automation over the next couple of years. Self-learning algorithms' without any supervision will ensure technology can do most things that humans can do. With the possibility of humans becoming redundant and the workforce displaced, a comprehensive approach to tackling the outcomes is necessitated. Retraining employees ensures that the impact of job displacement due to AI and ML is reduced to the minimum.

Explainability of AI models

With various decisioning related to application processing or loan sanctioning, credit limits and collections being done by algorithms, explaining the rationale behind such decisions becomes important. An inability to explain why a loan or a transaction was declined will lead to customer dissatisfaction. Self-learning algorithms run the risk of being labeled as biased based on gender, age or race if the decisions made cannot be logically explained to customers. With the growing advent of self-learning algorithms, the risk of being unable to explain the algorithm model increases, thereby making banks vulnerable to public scrutiny.

Solutions that leverage AI and ML for card payments

HSBC leverages customer and transaction data to customize product offerings, improve risk profiling and automate compliance initiatives. The bank also uses AI to deliver relevant rewards and loyalty offers to customers and has seen higher rewards redemption rates based on the AI-generated recommendations. The AI model analyzes a customer's demographic profile, transaction data, earlier reward redemptions and other financial parameters to identify the most suitable reward offers for the customer.

American Express offers a personalized travel solution to its customers through Mezi (acquired by Amex in 2018), an AI-powered personal travel assistance app. Customers can send a text with their request for reservations for flights, hotels, restaurants, etc., and Mezi provides personalized recommendations and makes the necessary travel arrangements.

Bank of America's chatbot, Erica, is available to mobile banking customers and has over 27 million active users. Customers can interact with Erica in three different modes – voice, tap and text. Erica can assist with money transfers, transaction searches, account balance inquiries and financial management. Financial management capabilities include Spend Path, a FICO score tracker, a subscription monitor and bill reminders. Erica studies people's situations and behaviors and offers proactive guidance and insights to help customers stay connected with their cash flow, to avoid surprises and identify savings opportunities. It has completed over 50 million client requests and has been engaged by more than 500,000 new users per month. Erica supports 400,000 ways in which clients can ask financial questions. It also notifies users about infrequent, abnormal charges and about any increase in a recurring charge.

State Bank of India (SBI) Cards has leveraged RPA to automate the follow-up process under chargebacks for disputed transactions. The RPA bot automates customer follow-ups to collect evidence and inputs for proper classification of disputes. SBI Cards has benefited from the reduction of 700 man-hours of effort per day due to the RPA initiative.

Trend 6: Payments data monetization

Payment System Directive 2 (PSD2) regulation and open banking initiatives across the globe are opening access to payments data for third-party providers.

Growth in data monetization adoption is driven by the continuous increase in enterprise-level data; the rise is leveraging big data technologies and awareness of potential benefits in adopting data monetization solutions. But data privacy and security regulations are significant constraints for market adoption of data monetization solutions.

Challenging regulatory requirements and competition from fintech startups have led to increased competition in payments businesses. Banks have started to look beyond the traditional payments service offerings and embrace data monetization to grow their revenue. Banks are using data-led insights to improve their existing business models and create new revenue streams by launching innovative products and services.

Recommendations for monetizing payments data

Banks are better positioned to monetize payments data to generate new revenue streams as they have a comprehensive view of the customer's profile. Differentiation lies in creating valuable products and services from payments data available in-house combined with data sourced from multiple external parties. Insights gained from

analytics can be used for real-time decisioning in cross-sell or upsell initiatives, reward offers, customer retention, etc.

Monetizing data will require organizations to be cognizant of data privacy and compliance regulations when harvesting data, storing data, manipulating data for commercial usage, etc. Organizations that plan to monetize payments data should have a well-defined data strategy in place. Data can be categorized as raw (containing personally identifiable information, PII), anonymous (PII is removed) or synthetic (cannot be tracked to original data set). Organizations must evaluate the risk and compliance issues inherent in certain data types. They can then choose to either: commoditize the anonymous or synthetic data, build new products for their customers using raw or anonymous data or innovate to create new revenue streams from the anonymous or synthetic data. Organizations can opt to use internal data or combine existing customer data with data sourced from external vendors to gain new insights that help create new products or revenue streams.

Payment providers with a presence in both the card-issuing and merchant-acquiring spaces have access to both consumer and merchant data. Payment providers with a presence in one business can develop partnerships with players in the other leg of the business. They can further combine externally sourced data with internal data

to build innovative products and services. The data strategy, in addition to the data privacy and compliance regulations, should be the guiding force to handle data ownership disputes.

Solutions that monetize payments data

Banks and payments industry players can leverage data analytics firms whose service offerings come with built-in capabilities for compliance with data privacy regulations and best practices in data security. This enables banks to pursue data monetization initiatives by leveraging large volume of in-house data along with data sourced from external sources.

Arm INSIGHT offers products to synthesize data (ARM Mimic) and ingest external data (ARM Refinery) – these offerings can be used to gain insights and capture business value from data troves. ARM Mimic allows banks to synthesize data while maintaining the statistical relevance required to gain necessary insights from the data. It synthesizes data within data privacy constraints and enables innovative and creative data monetization programs. The ARM Refinery data engine allows financial institutions to ingest data from different sources, aggregate and transform the data to get actionable insights, and upload to any database or cloud platform.

Data Republic offers the Senate Data Exchange Platform which helps organizations share data without risking nonadherence to customer privacy regulations or data security guidelines. The Senate Data Exchange Platform streamlines data collaboration across internal teams and also with external parties to avoid unauthorized data sharing. It provides an end-to-end view of the customer by securely combining data sets across the organization and a data enrichment facility to unlock customer insights. It facilitates a product innovation sandbox that allows organizations to rapidly test and evaluate new technology against internal data. It also allows banks to explore the potential of new data partnerships in a secure, auditable environment.

Ingenico offers a business intelligence tool named Elevate that enables firms to assess key performance metrics and help them benchmark their performance against their peers. Elevate is targeted at companies who handle international e-commerce transactions and process payments and customer disputes arising out of those e-commerce transactions. It facilitates the conversion of raw payments data into easy-to-use dashboards. The dashboards allow organizations to identify payment problems and opportunities and proactively act on them.

NGDATA offers the Intelligent Engagement Platform, a customer experience management solution that captures channel data to provide real-time insights to engage with customers.

The platform provides a suite of capabilities for banks to simplify campaign management. It also provides an "always on" customer intelligence capability that enables the generation of relevant and highly personalized recommendations to enhance the customer experience across all touchpoints.

TECHNOLOGY INNOVATION TO SCALE UP PAYMENTS OFFERINGS

Millennials are not inclined toward loyalty programs that require them to carry physical loyalty membership cards. US consumers hold 3.3 billion memberships, with an average consumer participating in at least seven programs. Points earned but never redeemed are 30% of total points awarded. A high percentage indicates that consumers are not connected with their loyalty programs.

Trend 7: Distributed ledger technology for loyalty programs

Customer trust and loyalty are critical to the success of any organization. With a customer-centric approach, loyalty and rewards have become focus areas and unique selling propositions for financial organizations across the globe. Conventional loyalty programs suffer from challenges such as low redemption rates, reward points lock-in with specific merchants, high operational costs, low customer incentives and a lack of uniform customer experience. In many loyalty programs, rewards are primarily driven by the total amount spent. There is potential to achieve multiple benefits from a well-defined loyalty program to target a brand, product or customer profile. Millennials are not inclined toward loyalty programs that require them to carry physical membership cards; however,

they do have an affinity for digital reward programs. A retailer or merchant may find it cumbersome to run a loyalty program due to the IT platform cost involved, customers disinterested in the onboarding process, abandoned points or competition from loyalty program offerings in the market.

For a merchant or retailer to launch a cobranded loyalty program with a card issuer or another ecosystem player involves high overhead due to the complexity involved in loyalty points accounting and the reporting process with cobrand partners. Blockchain-powered loyalty programs enable users to receive and redeem loyalty tokens in an interoperable manner across loyalty programs. Every merchant has permissioned access to a distributed ledger that hosts the

loyalty program in such a way that merchants cannot view each other's transactions. Benefits of leveraging blockchain for loyalty programs include interoperability, reduced third-party costs, increased adoption due to frictionless systems, near-real-time processes, and a secure and permissioned platform.

Recommendations for leveraging distributed ledger technology for loyalty programs

Rewards and benefits offered can act as a differentiating factor. With the benefits that blockchain-based loyalty solutions offer, and the problems inherent in traditional reward platforms, banks and industry players need to quickly adopt blockchain

technology. This will help create unique customer value propositions through a unified platform for all participating partner merchants, thus enabling a frictionless system.

For blockchain-based loyalty programs to be successful, merchants may offer reward points using varying loyalty scheme definitions. Reward points calculation, conversion and redemption must be transparent and easy for consumers to comprehend. This would otherwise lead to disinterest from consumers and result in low adoption.

It is imperative to provide a seamless onboarding program for partner merchants and other stakeholders into the blockchain-based loyalty programs. These programs also need to comply with regulatory mandates on transaction data and customer data privacy rules that vary from region to region. In case tokens are used, token life cycle management becomes crucial, and the approach needs to be in consensus with all the stakeholders.

Card issuers would need to integrate their core processing accounts receivable platform with blockchain-based loyalty platforms. This ensures the details of registered merchants and customers and loyalty program terms and conditions are seamless across channels and all player-touchpoints. A consolidated reward points statement must be made available to consumers. This makes it simple for the card issuer and ecosystem players to articulate the benefits accrued to the consumer.

Solutions that leverage distributed ledger technology

Singapore Airlines has launched a blockchain-based digital wallet based on KrisFlyer, its air miles program. The wallet enables flyers to convert their unused airline miles (KrisFlyer miles) into reward points (KrisPay miles). If the unused air miles are not sufficient for redemption at the airline, they can be tokenized as reward points. Consumers can redeem them at merchant outlets including fuel, retail, food and beverage, that are not directly participating in the air miles program.

American Express has launched a distributed ledger that allows merchants to offer Amex reward points to their consumers on their respective mobile apps or websites and not depend on a credit card as a channel to offer reward points. The distributed ledger provides Amex with insights on products and services that consumers purchase; these insights are not available to Amex with credit card purchase transactions, which carry the merchant name but not details of the items purchased.

Appsolutely is a Philippines-based omnichannel loyalty solution company. It offers LoyalCoin, a blockchain-based crypto-currency offered as rewards points. LoyalCoin earned by transacting at merchant outlets can be redeemed at any merchant participating in the program including McDonald's in the Philippines. Consumers can convert their LoyalCoin into other cryptocurrencies such as bitcoin or Ethereum.

Trippki enables hotels to reward their guests with TRIP tokens that are cryptocurrency issued on the Trippki platform, built using Ethereum DApp technology. TRIP tokens can be redeemed against hotel room bookings on the Trippki platform. Trippki also keeps track of blockchain events across the globe, enables crypto enthusiasts to book hotel rooms and gather their reward points as TRIP tokens. Hotels can launch bespoke reward programs using the Trippki platform to meet the varied needs of the traveler community rather than provide standard reward offerings that are widely available in the market. Guests staying in hotels booked through Trippki can get rewarded with TRIP tokens for writing reviews.

qiibee enables merchants to issue reward points as cryptotokens on the qiibee platform, which runs on Ethereum blockchain and uses qiibee protocol. These reward points are backed by QBX, which is the qiibee platform's own token.

Trend 8: Cloud for platform scalability and resilience

Adopting emerging technology has been a challenge for traditional financial services firms, especially the midsized and small players. Changing technology trends, paucity of skilled resources in niche technologies, and the cost and risk involved have inhibited these firms from adopting emerging technologies. On the other hand, traditional players face increasing competition from fintech startups that have built their platforms based on a digital-first approach and do not face the burden of integrating their digital with their legacy back ends. The bank of the future is expected to look very different from today. Midsized and small traditional players in the financial services industry need to equip themselves to face the onslaught of competition from nontraditional players, changing consumer expectations, emerging technologies and alternative business models. Cloud is a solution that can help financial organizations be future ready.

Cloud enables institutions to cope with changing business demands, pursue new business opportunities that demand platform capabilities, and be agile in scaling resources with increasing speed and elasticity. It enables an organization's technology leadership team

to focus on business goals and lets the technology operations team handle the organization's computing demands. Cloud computing helps increase agility, scale higher, optimize utilization of IT resources and saves cost through the use of pooled assets.

Traditional players are held back by legacy systems that increase costs and slow down the time to market for new products. Cloud helps them modernize their back-end platforms to align with the latest technology trends. Cloud-based platforms allow them to offer Platform as a Service (PaaS) and explore additional revenue streams.

Organizations can launch "software as a service in the cloud" as an offering to provide platform capabilities using the multitenant architecture. Resiliency of IT platforms and the ability to quickly recover from failures are critical. Industry players consider cloud a go-to approach to enable enterprise platform transformation. According to an Infosys Knowledge Institute study, 50% of financial services and insurance respondents had shifted all or some critical enterprise applications to the cloud. The market for cloud offerings is expected to grow by 8% annually until 2024.

Recommendations for leveraging cloud

Infrastructure as a service (IaaS), platform as a service (PaaS) and software as a service (SaaS) are the three main approaches for embracing cloud services. Corporations subscribing to SaaS services can use applications without the need to internally manage infrastructure components or application development. Based on computing needs and an assessment of service providers' capabilities, a decision must be made to choose the cloud model and the service provider.

Banks can "lift and shift" their existing landscape into a cloud setup; however, this approach may not allow banks to enjoy the complete set of features and benefits offered by cloud infrastructure. As part of their platform modernization journey, banks can rebuild core processing platforms as digital-first platforms that embrace API-based and microservices-led architecture principles. Such redesigned applications will enable banks to fully benefit from the scalability, reliability and resilience that cloud infrastructure offers.

Irrespective of the cloud model, institutions need to focus on security measures and controls at all layers of the cloud infrastructure. Any breach in regulation in a cloud setup would be detrimental to a bank's reputation and consumer confidence in the bank's brand.

Bank platforms tend to have multicurrency, multicountry features given the multicountry operations of banking players. As part of their cloud journey, institutions can consider instilling multitenancy features into their core processing platforms. This enables to monetize platforms and extend capabilities to smaller traditional players and emerging fintech players. This approach can go hand in hand with a bank's strategy of competing and collaborating with fintech players.

Embracing DevOps, Continuous Development, Continuous Integration and process automation has become important in an API-led platform development where development communities are spread across locations. DevOps and agile approaches enable banks and

industry players to reduce time to market and evolve platform functionality in a collaborative way with other ecosystem players. Industry players are increasing their focus on reduced cycle times for new product launches, introducing minimum viable products, building platform capability sets in an iterative manner, and designing platforms with scalability and resilience as core principles. In such a transformative approach, the cloud journey can be accelerated and amplified by players embracing DevOps and agile approaches to platform development.

Solutions that leverage cloud

Banking players in the US, Europe and Asia are leading cloud adoption. US-based card issuer Capital One leverages Amazon Web Services (AWS) for its cloud needs. Spain's Bankinter and the UK's OakNorth are using AWS to host their banking platforms. Holvi, a digital bank for freelancers and small-business owners runs current business account services

with money management tools and a Mastercard debit card. It enables small-business owners to manage their finances on a platform runs on AWS. Starling Bank and Monzo are digital-only banks in the UK that leverage AWS for their core platforms. Starling Bank and Monzo run their analytics platforms on BigQuery, deployed on GCP.

In January 2019, Cantilan Bank Inc. became the first Philippines bank to fully leverage a cloud-based SaaS system for its core banking system needs. Singapore's DBS is one of the early adopters of cloud in the Asian banking industry. Indonesia-based bank BRI runs its platform on Google Cloud Platform (GCP).

EMBRACING INNOVATIVE FINTECH BUSINESS MODELS

POS financing provides consumers with instant loan processing to enable them to complete purchases. The loan size could range from hundreds to thousands of US dollars. Consumers can pay the loans in installments. POS financing provides unsecured loans within minutes at low interest rates without a preapproval, and with a simple and seamless loan setup. This form of financing is emerging across retail websites and in stores as an alternative to credit cards.

Trend 9: POS financing and noncard lending

Installment purchase has become popular since the 2008 recession: 41% of US consumers have used an installment loan and 28% of shoppers now prefer a retailer that offers the option. TransUnion has reported that unsecured personal loans were the fastest-growing debt type in the US in 2018, growing 19% year over year, indicating an uptick in alternative financing solutions.

52% of Gen Z and 60% of millennials say they are interested in payment methods other than traditional credit cards to finance large e-commerce purchases. Only one in three millennials carries a credit card and about

one in 10 millennials says they have carried credit card debt for five years. Millennials and Gen Z are drawn to POS financing due to their aversion to high interest rates levied on credit cards and the open-ended nature of credit card outstanding. In contrast, POS financing loans have fixed tenure for repayment with interest rates that are lower than those on credit cards. Few fintech startups provide budgeting tools to help consumers track their monthly budgets along with loan tracking. POS financing fintech companies have gained traction by removing consumers' pain points such as lack of understanding as to how

the annual percentage rate works, which they address by offering transparent and fixed credit terms.

Fintech startups leverage mobile apps for loan processing to ensure a paperless and digital-first approach to consumer onboarding. They have built platform capabilities to leverage nontraditional data sets for credit scoring apart from the usage of traditional credit bureau data. Their digital-first approach ensures a frictionless purchase experience for the consumer and influences the user experience at the point of sale. Traditional banks such as Citizens Bank have also built product offerings in this

space. Citizens Bank offers POS financing at Apple Stores and its merchant-financing loan portfolio has grown to over US$1 billion.

Recommendations for POS financing and noncard lending

To mitigate the threat posed by POS financing upstarts, traditional players must take certain steps to compete effectively. Most card issuers allow transactions above a certain value to be converted into installment loans payable over three to 36 months. Banks must offer this facility through digital platforms for a hassle-free consumer experience. Text messages to cardholders with a list of eligible transactions that can be converted into installment loans can be helpful. Card issuers and acquiring banks can launch APIs that enable consumers to make purchases at merchant outlets and online stores with a financing facility. Card issuers' insights into consumer credit histories and credit behaviors would enable them to price the loans instantaneously. Offering APIs to enable loans at the point of sale would lead to increased sales for merchants, who would be willing to route such transactions on a card payment rail, that would have otherwise been processed as consumer loans outside card networks.

Lending to existing customers makes it possible for card issuers to process significant parts of consumer loan requests without the consumer going through a fresh credit application process. This gives existing players an advantage by making the process frictionless for merchants and customers.

Consumers expect an omnichannel experience for POS loans. The user experience across physical stores, the web and mobile apps needs to be consistent and should be built around ease of experience, instant decisioning and loan processing. Loan program features need to be aligned with consumer needs in terms of ticket size, upfront fees or monthly fees, loan duration, etc.

Banks and card issuers must build strong relationships with ecosystem partners — large retail chains, small retailers, fintech firms and card networks. This will ensure that banks and card issuers stay invested in consumer mindshare and do not fall behind fintech firms.

Solutions for POS financing and noncard lending

Several traditional and fintech firms have successfully distinguished their POS financing solutions across countries through their scale, marketing initiatives or targeting of specific audiences. Klarna is a Sweden-based POS financing provider with 130,000 merchant partners that supports 60 million shoppers across the US and 14 markets in Europe, including the UK and Germany. Klarna's customer acquisition strategy has been largely millennial focused. It offers a direct-to-consumer app to shop, engaging customers through features like price-drop notifications and a wish list. The Klarna solution is integrated into retail stores like Zara, Ikea and Asos. It has launched Mindful Money, a digital content hub for money management and responsible lending, tailored for millennials. In 2018, Klarna's annual loan volume growth grew 36% to US$29 billion. The firm monetizes purchase transactions through merchant fees rather than charging interest.

Affirm is a US-based POS financing provider focused on serving consumers without credit histories, savings accounts or access to small loans. It has over 2,000 merchant partners, including retailers like Warby Parker, Room and Board, and David Yurman. Affirm has built its own algorithms for predicting the loan repayment eligibility of consumers. Its algorithm considers factors like the price of an item being purchased to understand a customer's risk profile. Affirm monetizes purchase transactions through interest levied on consumers but doesn't charge fees or a prepayment penalty. The Affirm InStore service enables consumers to apply for Affirm loans at the physical point of sale through a virtual card. The firm has partnered with Walmart to enable POS financing at over 4,000 store locations and on Walmart.com.

Australia-based Afterpay focuses on the fashion and beauty industry and enables buyers to pay in four equal installments. Globally, Afterpay has over 4.3 million customers and more than 30,000 merchants. Its merchant network comprises more than 10% of the US fashion and beauty industry. Afterpay enables 25% of all online fashion and beauty transactions in Australia. The company holds biannual promotional events to coincide with the back-to-school shopping period, with discounts at retailers like Steve Madden and NARS.

Consumers can use Square Installments offerings through mobile apps to avail themselves of POS financing loans with repayment durations of their choice. Amazon store cards are offered by Synchrony Bank and can be used by consumers for loans with predefined tenures. Amex "Pay It Plan It" offerings enable cardholders to select up to 10 purchase transactions and convert them into installment loans lasting up to 24 months.

Mastercard recently acquired Vyze, a fintech firm that connects merchants to multiple POS financing lenders. Vyze offers an API that allows merchants to offer credit options in store and online. PayPal Credit is an online financing product and virtual line of credit offered by PayPal. Buyers can split payments of US$99 or more over six months at any merchant that accepts PayPal. Ally Financial has decided to reduce its focus on credit card business and increase its focus on the POS loan model. Ally recently acquired Health Credit Services, which offers unsecured loans to finance medical procedures. Ally plans to increase its focus on POS lending business across categories in the retail sector. The "My Chase Plan" offerings from JPMorgan Chase enable Chase credit card holders to convert past purchases into installments that attract monthly fees.

Trend 10: Escrow services for consumer payments in digital commerce

Online purchases are considered riskier than ones made in brick-and-mortar stores as there is an element of risk involved that the product to be delivered may not be the same as the one promised on the website or that the online retailer will not deliver the product. According to Experian, e-commerce fraud increased 30% in 2017 year-over-year in the US. In the UK, fraud increased 27% in 2018. The two most common frauds are shipping fraud and billing fraud. Shipping fraud, where fraudsters use their own address to receive delivery of stolen goods purchased online, grew by 37% in 2017. In billing fraud, the victim's address is used for payment for the stolen goods purchased. Billing fraud increased by 34% in 2017. Escrow services helps solve the issues of trust, fraud and security between the online buyer and seller. With escrow services, a third-party service provider collects and holds on to the money on behalf of the seller and pays the seller if the buyer is happy after the product has been received.

PayPal has been delivering similar services since 1999. It is relatively easy for buyers and sellers to use PayPal for payment processing. It is also convenient for cross-border transactions in which the buyer and seller may not have a common payment instrument. PayPal also provides a dispute resolution process for cases where the buyer and seller cannot come to an agreement. Once a buyer initiates the dispute resolution process, PayPal holds the transaction amount until the dispute is resolved. If the buyer and seller cannot reach an agreement, the dispute becomes a claim. Claims give PayPal the authority to investigate the case and determine an outcome.

To provide escrow services for e-commerce marketplaces that do not have the size or capability to offer such services, new-age solution providers such as escrow.com, MANGOPAY, Shieldpay, Stripe Connect and Braintree have sprung up globally.

Recommendations for escrow services in consumer payments

The escrow services providers have transaction fees that are higher than PayPal's, as they provide better arbitration services and have built-in checks at every stage to prevent fraud. Yet, these higher fees may be a deterrent for smaller e-commerce websites. The pricing structure must be designed in a way that aids both small- and big-ticket sales and caters to the volumes of small and large retailers. For example, Escrow.com's solution is suitable for transactions in excess of US$500 due to the way the site has designed its pricing structure.

E-commerce sellers want to serve customers worldwide and supporting cross-border transactions is necessary. Escrow service providers must support global currencies and markets to serve buyers globally. They must provide various payment methods such as debit and credit cards, bank payments, wire transfers, e-wallets and PayPal. It is necessary to verify all the parties involved in a transaction as the onus is on the escrow service provider. Yet, the verification must be fast and secure. They should also have platform capabilities to perform Know Your Customer (KYC) verification instantaneously.

Escrow solutions must be simple and easy to integrate into e-commerce marketplaces. The third-party providers can provide APIs and premade user interface components to integrate into the marketplaces to reduce time to market and simplify operations. This will allow e-commerce websites to customize the onboarding process while being able to set payout timing, process complex money movements and integrate financial reporting. The escrow solution providers also need to focus on creating a safe experience for online platforms with their prevention tools and in-house fraud engines that notify buyers and let them take action against suspicious behavior in transactions.

Solutions for escrow services for digital commerce

Well-established marketplaces and e-commerce retailers such as Amazon, eBay, Etsy, Alibaba and Walmart have been using escrow services to the advantage of both buyers and sellers. Alipay offers buyer and seller protection with escrow services. When a buyer purchases a product, Alipay collects the money from the buyer and holds it an escrow account until the buyer receives the product and confirms the same. This provides a system of guarantee. In case of a dissatisfied consumer due to any problem with the product, Alipay refuses to pay the seller, thereby protecting the interest of the buyer. There is also a provision of chargeback like the one provided by credit card companies. In case of a dispute, the arbitration cell intervenes and is another service offered as part of the escrow solution. This has helped Alipay attract many loyal customers and have a market share equivalent to Amazon and eBay combined.

The Shieldpay escrow solution allows verification of the identity of all parties involved, collection of funds, parking of funds and the release of funds when both parties are satisfied. Shieldpay is integrated into Visa's CyberSource platform that allows secure P2P payments, which has been difficult in the past. This, in turn, has allowed Visa to accept payments in lesser-known marketplaces and ad sites.

Escrow services are now being adopted for P2P high-value transactions such as preowned car sales on marketplaces like Craigslist, eBay and Hemmings. Escrow solutions such as PaySafe allow transactions for preowned cars to be reviewed at every stage – such as ownership title, history report and inspection, before the funds can be released to the seller. This is a new business marketplace where transactions in the range of US$5,000 to US$30,000 can be done without any friction. This is in contrast to the earlier fortified preowned brick-and-mortar car dealership model.

Currently, very few commercial vehicles are sold online. The new e-commerce escrow solutions will pave a way forward for even higher-value commercial vehicles to be bought and sold on marketplaces. TruckTractorTrailer.com recently partnered with escrow solution provider Accruit to enter this untapped market.

Payoneer has started offering B2B escrow services for online transactions. According to a Payoneer survey, nearly 75% of respondents declined to conduct transactions due to the high risk perceived. Using escrow in B2B transactions opens up cross-border commerce.

As escrow becomes more integrated into online sales, high-value items including preowned cars, commercial vehicles, construction equipment and luxury items like art could soon be purchased with the same online ease as less-expensive goods.

PRODUCT INNOVATION-LED DIFFERENTIATION IN PAYMENTS OFFERINGS

Industry players are launching innovative payments offerings to differentiate themselves in a crowded marketplace. Bitcoin-backed debit cards issued with Visa and Mastercard logos enable acceptance with merchants across the globe. The cryptocurrencies are integrated with fiat currencies and transferred to the bitcoin-linked debit card using a cryptocurrency wallet. The bitcoin-linked debit cards can be used for making transactions similar to normal debit cards, with no change in the merchant's infrastructure for bitcoin card acceptance. Bitcoins get converted to fiat currency at the card issuer's end during transaction processing.

Trend 11: Cryptocurrency in cards

The global cryptocurrency market is expected to grow at 6.2% annually until 2024 to reach US$1.4 billion. From the increased launch of product offerings, it is evident that cryptocurrencies are increasingly being considered as a feasible option for payment across multiple regions. Bitcoin-backed debit cards allow users to use their cryptocurrency widely. Cardholders can make purchases and payments and withdraw fiat currency from an ATM, similar to how they use debit cards linked to bank accounts. Bitcoin can be turned into fiat currency in a quick and easy way by using these debit cards. With the traditional payment systems still dominating the finance market, the crypto debit cards are paving the way for expansion of digital currencies in the payments domain. Increased adoption of bitcoin-backed debit cards is coming at a time when major card networks such as Visa, Mastercard and Amex are focusing on digitizing cross-border corporate payments using blockchain and distributed ledger technologies. These card network majors are investing in and collaborating with fintech companies that are working to reduce friction in the consumer-to-consumer and B2B payments domains.

Recommendations for leveraging cryptocurrency in card products

To increase the uptake of crypto-based card product offerings, the shortcomings of the current market offerings must be removed. Currently, issuers of bitcoin-backed debit cards charge a fee to facilitate the service. The fees levied on bitcoin-backed debit cards vary across issuers. However, consumers do not pay any fees if they pay directly at retailers through a cryptocurrency exchange-supported transfer mechanism. Bitcoin-backed debit cards increase the probability of cyber theft, since users must transfer their virtual currency to a mobile wallet to use them.

As an alternative, a crypto asset held with a crypto exchange can be treated as collateral against which a loan can be provided to the user in fiat currency. In cases where the cardholder fails to pay the outstanding balance, the crypto asset can be liquidated by the card issuer. The card issuer can store the spend details in a decentralized network using distributed ledger technology. Credit cards backed by cryptocurrency as security collateral can be made more effective and trustworthy by leveraging smart contracts and blockchain technology in maintaining the digital agreement between the parties in the ledger. This would increase transparency and governance and reduce the scope for disputes.

The distributed ledger-based approach will ease the burden of complying with AML KYC norms for both card issuers and cardholders. Cardholders' identity details that are AML KYC compliant, can be stored in a centralized repository to which multiple industry players have permissioned and need-based access.

Banks can leverage big data, AI and ML to improve their product offerings that involve cryptocurrency. AI and ML can be leveraged in areas such as bad actor detection or fraud detection related to cryptocurrencies, wallet behavior analysis (for behavioral pattern analysis of individual investors), on-chain power factors for identification of unique factors influencing the behavior of the crypto asset, and fund-flow analysis (for analysis of fund transfers between exchanges or other entities). Big data can also be used in analyzing the spending pattern of cards linked to cryptocurrency wallets, thereby providing personalized reward offers to promote such spends.

Solutions that leverage cryptocurrency in card products

BitPay offers Visa prepaid cards that are linked to cryptocurrency wallets and instantly convert the bitcoin core to bitcoin cash and then to fiat currency for online payments. Wirex supports a crypto reward program for converting the spends using Visa debit cards into crypto rewards, which can be either spent or converted to other currencies with a different wallet for each cryptocurrency. Revolut, a UK-based fintech startup, offers the Revolut Metal card with a Mastercard logo and provides access to five cryptocurrencies and 150 fiat currencies. MCO Visa prepaid cards provided by crypto.com let holders buy, sell and track digital coins by linking the cards to mobile wallets.

Coinbase allows its customers to make contactless, chip or PIN-based transactions anywhere in Europe where Visa payments are accepted and charges a liquidation fee for each transaction, as spending cryptocurrencies causes liquidation of the same. Bitcoins can be loaded on Xapo debit cards using real-time conversion. Users can pay fees to Xapo using bitcoins. Coinbank issues physical cards and virtual cards that can be loaded with litecoin and bitcoin. Uquid allows crypto payments in bitcoin and over 80 additional altcoins with a Uquid wallet or debit card supporting three fiat currencies. Uquid Android and iOS apps are also offered.

Facebook plans to launch virtual currency Libra. Virtual currency will be issued using a permissioned blockchain. Bitnovo offers prepaid debit cards that can be reloaded instantly using bitcoins and in Spain additionally provides the option of buying bitcoins through its app, website and vouchers. Bitwala, a Europe-based crypto exchange, collaborates with a German fintech startup allowing consumers to perform different forms of funds transfer including SEPA. FuzeX is a cryptocurrency payment card that is NFC enabled and has an EMV chip with a barcode display.

Trend 12: Multicurrency cards for corporate travelers and tourists

Consumers and corporate employees use credit cards for their payment needs when they travel abroad. Alternatives such as foreign currency or traveler's checks are available, but they need to be purchased prior to travel and fees are incurred when unused quantities are returned. Usage of foreign currency leads to the accumulation of coins, which cannot be converted to domestic currency.

Using credit cards during foreign travel does not require any specific planning and is very convenient to the users due to the wide acceptance of credit cards internationally. Credit cards typically provide reward points, fee-based fraud protection, insurance facility, and the option to block the card and have a replacement card issued. However, usage of credit cards during foreign travel has its own set of disadvantages such as foreign currency transaction fees, ATM cash withdrawal fees, exchange rate markups and interest levied if the outstanding balance is not paid in full within the stipulated time.

Card issuers use a foreign currency conversion markup of 1% to 3% over the conversion rate used by card networks such as Visa or Mastercard. ATM cash withdrawals attract a fee levied by the card issuer as well as by the ATM service provider or the

acquiring bank. Card issuers levy a foreign currency transaction fee on each transaction done on the credit card. This burdens the cardholder with too many fees and a lack of visibility into the total amount in local currency that he would incur if he were to do a transaction abroad.

Some of the acquiring banks provide their merchants with dynamic currency conversion (DCC) services to ease these problems and to enable merchants to attract foreign travelers to their stores. As part of DCC services, the cardholder will be shown the transaction amount in the foreign currency and the amount in the cardholder's local currency for which authorization will be taken. Any fees levied by the merchant (or DCC service provider) will be included and displayed to the cardholder in their local currency. The transaction gets processed by the card issuer in the cardholder's local currency and hence does not involve any foreign currency conversion or related markups or foreign transaction fees. DCC provides complete visibility to the cardholder on the transaction amount that is being charged in local currency for all transactions.

As an alternative to credit cards, many fintech startups and banks have come up with prepaid or debit card-based product offerings for foreign

travel targeted at consumers and corporate users. The multicurrency prepaid travel cards can be loaded with one or multiple currencies that are supported by the card issuer. Each currency is loaded in a separate wallet. Some cards allow converting the balance available in one currency wallet to another, if required. Prepaid travel card issuers bundle value-added services such as travel insurance, mobile apps for online tracking and monitoring, concierge services, and emergency services with the travel card. However, industry players levy fees when loading foreign currency into the wallet and when returning the unused balance in local currency.

Multicurrency debit cards are linked to a savings or checking account in the user's local currency. At the time of transaction, the transaction amount in foreign currency is converted to the local currency equivalent and the bank account is debited. These debit cards come with mobile app facility for transaction tracking and monitoring. Unlike credit cards, the foreign currency conversion rate is attractive and there is no foreign transaction fee. Unlike prepaid travel cards, these debit cards do not attract any fees for loading or refunding since the bank account balance in local currency is used.

Recommendations for multicurrency card product features

Card product offerings with multicurrency features should be accompanied by robust digital capabilities and a higher level of customer service. Digital front ends for cardholder acquisition, customer servicing and omnichannel customer service support are a prerequisite as cardholders may need customer support in a foreign country with limited access to mobile data and no access to physical branches. Moreover, the card may be the key (or the only) source of funds for the cardholder. Hence, digital front ends and omnichannel customer service will provide the necessary support to cardholders.

Mobile apps can be leveraged for digital KYC and instant onboarding of the cardholder. Spend controls (merchant category, transaction limits, transaction types) can be offered as a self-service through mobile apps. Mobile apps can be used for location tracking or geofencing and this could come in handy in scenarios where transactions could arise from locations outside the intended country of travel. Ease of use and a feature list of mobile apps could be potential service differentiators for the card issuer. Mobile apps can enable real-time loading (the source of funds could be the bank account held by the cardholder

at the card-issuing bank, or the cardholder could transfer money in real time from a different bank to the card issuer). Features such as ATM locators, claims expense management (for corporate cards) and travel insurance will be of immense help to the cardholder.

Transparent pricing and lower fees would be great incentives for travelers to use multicurrency card products. The card issuer can consider partnering with ATM service providers in key foreign markets to enable lower ATM withdrawal fees for cardholders. In the case of prepaid travel cards, features such as the ability to convert a balance from one currency to another, multi-currencies support as part of the card wallet and lower fees for load, reload or refund would persuade the cardholder to retain the multicurrency card for subsequent travels.

With increased offerings from fintech startups and market adoption of open banking and the second European Union Payment Services Directive initiatives, card issuers need to embrace open APIs and third-party integration for a complete and collaborative approach with the ecosystem players. Card issuers can provide APIs to pull data for reporting, regulatory needs, expense tracking, claims management and other purposes. They can provide these facilities through their in-house platforms or they can integrate with third parties.

Card issuers with multicountry market operations can leverage their relationships with hotels, restaurants and other tourist-related establishments for loyalty offers on multicurrency cards used by foreign travelers (cards issued by banks' entities operating in the home countries of the travelers). Such card issuers can leverage the cardholder profile and transaction data to run market campaigns on behalf of merchants related to the tourism industry. Loyalty offers would tempt cardholders and enable merchants to attract increased footfalls of higher-spending foreign travelers.

From a corporate card perspective, the incumbent large banks or travel card issuers have the advantage of an in-depth understanding of corporate needs due to long-term relationships and their ability to provide bespoke solutions to meet corporate needs. However, fintech startups are disrupting the market by providing lower fees, transparent pricing, ease of third-party integration, API-enabled platform access and digital front ends. Incumbent players must create innovative product features, leverage digital front ends and tap into data monetization initiatives for loyalty offers to stay relevant and remain competitive in an evolving marketplace.

References

Trend 1: Rapid rise of real-time payments

- https://www.pymnts.com/news/faster-payments/2019/real-time-ubiquity-tch-federal-reserve/
- https://www.fisglobal.com/insights/what-we-think/2019/november/what-is-next-for-real-time-payments
- https://www.pymnts.com/tracker/faster-payments-november-2019/

Trend 2: Real-time cross-border payments

- https://www.pymnts.com/smarter-payments/2019/why-cross-border-payments-need-transparency-overhaul/
- https://ripple.com/use-cases/banks/
- https://www.ibm.com/blockchain/solutions/world-wire
- https://www.swift.com/news-events/press-releases/swift-enables-payments-to-be-executed-in-seconds
- https://www.paymentsjournal.com/to-pay-or-to-be-paid-that-is-the-answer/
- https://usa.visa.com/run-your-business/visa-direct.html
- https://www.mastercard.us/en-us/issuers/products-and-solutions/customer-needs/consumer-solutions/mastercardsend.html

Trend 3: Digital payments

- https://en.wikipedia.org/wiki/Ultrasound
- https://economictimes.indiatimes.com/small-biz/startups/features/this-amazon-backed-startup-makes-digital-payment-possible-without-internet-tonetag/articleshow/71042246.cms
- https://www.finextra.com/blogposting/17881/5-important-mobile-wallet-trends-you-need-to-know
- https://www.paymentsjournal.com/5-global-trends-that-will-affect-digital-payments-in-india/
- https://www.paymentscardsandmobile.com/mobile-wallet-trends-annual-report-2019/
- https://www.marketwatch.com/press-release/e-wallet-marketanalysis-by-growth-emerging-trends-and-future-opportunities-till-2023-2019-10-14

Trend 4: ISO 20022 adoption in payments

- https://www.swift.com/your-needs/industry-themes/iso-20022
- https://www.iso20022.org/adoption.page
- https://www.nacha.org/system/files/resources/ISO-20022-Frequently-Asked-Questions.pdf

Trend 5: Artificial intelligence and machine learning in cards

- https://newsroom.bankofamerica.com/press-releases/consumer-banking/bank-americas-ericar-completes-more-50-million-client-requests
- https://www.finextra.com/pressarticle/78566/bank-of-america-chatbot-logs-50-million-requests-in-first-year
- https://www.creditconnecter.com/credit-cards/
- https://becominghuman.ai/how-ai-has-impacted-the-credit-card-industry-be2db758cce9
- https://www.creditcards.com/credit-card-news/artificial-intelligence-credit-cards.php
- https://emerj.com/ai-sector-overviews/artificial-intelligence-credit-cards/
- https://www.fintechnews.org/the-crirital-role-of-artificial-inteliigence-in-payments-tech/
- https://www.livemint.com/Home-Page/6PqZ9XLJIljC0VPDpD35KP/How-credit-card-issuers-can-gain-from-machine-learning.html
- https://www.mastercard.ca/en-ca/issuers/products-and-solutions/grow-manage-your-business/loyalty-solutions/pay-with-rewards.html
- https://mezi.com/
- https://thefinancialbrand.com/84350/bank-of-america-chatbot-erica-retail-banking-virtual-assistant/
- https://www.businesswire.com/news/home/20190528005646/en/Bank-America's-Erica®-Completes-50-Million-Client/
- https://www.infosys.com/industries/financial-services/documents/robotics-process-automation-cards.pdf
- https://www.businesswire.com/news/home/20180925005512/en/NICE-Deploys-Robotic-Process-Automation-SBI-Card
- https://www.sbicard.com/sbi-card-en/assets/docs/pdf/who-we-are/news/2019/express-computer-online-rpa.pdf
- https://www.bernardmarr.com/default.asp?contentID=1263
- https://www.darkreading.com/application-security/how-ai-and-cybersecurity-will-intersect-in-2020/d/d-id/1336621?image_number=7

- https://www.forbes.com/sites/quora/2018/10/09/how-artificial-intelligence-job-displacement-will-affect-the-worldwide-econo-my/#3c20eb7c1f52
- https://www.bbva.com/en/self-driving-banking-using-technology-to-connect-with-customers/
- https://www.cbronline.com/news/hsbc-client-intelligence-utility

Trend 6: Payments data monetization

- https://www2.deloitte.com/content/dam/Deloitte/ch/Documents/financial-services/ch-en-fs-disruption-payments.pdf
- https://www.alliedmarketresearch.com/data-monetization-market
- https://www.arminsight.com/
- https://go.datarepublic.com.au/senate-platform/
- https://www.ngdata.com/ngdata_iep/
- https://www.ingenico.com/epayments/data-analytics

Trend 7: Distributed ledger technology for loyalty programs

- https://patents.justia.com/assignee/american-express-travel-related-service-company-inc
- https://www2.deloitte.com/us/en/pages/financial-services/articles/making-blockchain-real-customer-loyalty-rewards-programs.html
- https://www.bigcommerce.com/blog/customer-loyalty-blockchain/#businesses-adopting-blockchain-loyalty
- https:\www.tothenew.com\blog\reinventing-loyalty-programs-with-blockchain-technology\
- https://hackernoon.com/blockchain-can-save-customer-loyalty-programs-from-becoming-unfruitful-3992c6bc6053
- https://dragonchain.com/blog/loyalty-and-rewards-programs-reinvented-with-blockchain/
- https://www.plugandplaytechcenter.com/resources/enhancing-customer-loyalty-programs-blockchain/
- https://www.disruptordaily.com/blockchain-startups-marketing/

Trend 8: Cloud for platform scalability and resilience

- https://www.infosys.com/services/cloud/insights/documents/cloud-apps-financial-services-insurance.pdf
- https://www.mordorintelligence.com/industry-reports/cloud-enabling-technology-market
- https://www.computerworld.com/article/3145622/capital-one-rides-the-cloud-to-tech-company-transformation.html
- https://fintechnews.ch/virtual-banking/hottest-digital-first-challenger-banks-by-country-in-europe/32245/
- https://searchcloudcomputing.techtarget.com/definition/Infrastructure-as-a-Service-IaaS
- https://searchcloudcomputing.techtarget.com/definition/Platform-as-a-Service-PaaS
- https://searchcloudcomputing.techtarget.com/definition/Software-as-a-Service

Trend 9: POS financing and noncard lending

- https://www.jifiti.com/glossary/pos-financing/
- https://thefinancialbrand.com/84711/point-of-sale-pos-lending-finance-fintechs-banks/
- https://www.forbes.com/sites/ronshevlin/2019/03/04/jpmorgan-chase-enters-a-hot-fintech-space-point-of-sale-pos-financ-ing/#6ac89b61f158
- https://www.bankingdive.com/news/banks-holiday-retail-point-of-sale-loans-citi-jpmorgan-chase-mastercard-affirm/568293/
- https://www.supermoney.com/point-of-sale-lending/
- https://www.forbes.com/sites/ronshevlin/2019/03/04/jpmorgan-chase-enters-a-hot-fintech-space-point-of-sale-pos-financ-ing/#6323d6e0f158
- https://www.aseantoday.com/2019/03/point-of-sale-finance-the-next-big-thing-in-fintech-development/
- https://www.businesswire.com/news/home/20190416005294/en/
- https://www.bankingdive.com/news/ally-credit-card-point-of-sale-loan/559131/
- https://www.businesswire.com/news/home/20190416005294/en/
- https://www.businessinsider.com/paypal-credit-launches-in-the-uk-2016-4
- https://www.paypal.com/us/webapps/mpp/paypal-credit
- https://thefintechtimes.com/paypal-credit/
- https://www.forbes.com/sites/ronshevlin/2019/03/04/jpmorgan-chase-enters-a-hot-fintech-space-point-of-sale-pos-financ-ing/#6ac89b61f158

- https://www.bankingdive.com/news/banks-holiday-retail-point-of-sale-loans-citi-jpmorgan-chase-mastercard-affirm/568293/
- https://intelligence.businessinsider.com

Trend 10: Escrow services for consumer payments in digital commerce

- https://wpriders.com/business/escrow-payment-solutions-for-your-online-marketplace/
- https://www.pymnts.com/disbursements/2018/digital-escrow-big-ticket-ecommerce-accruit-ingo-money/
- https://www.finextra.com/pressarticle/76755/shieldpay-agrees-partnership-with-visa-to-enable-secure-use-of-payment-cards-on-p2p-marketplaces
- https://www.ecommercebytes.com/2017/08/08/ups-offers-b2b-escrow-service-payoneer/
- https://www.b2bpay.co/b2b-electronic-payments
- https://ecommerceguide.com/guides/b2b-ecommerce-payment-systems/
- https://dinarys.com/blog/7-b2b-ecommerce-payment-systems
- https://marketplace.webkul.com/role-of-escrow-payment-in-e-commerce-marketplace/
- https://www.pymnts.com/news/b2b-payments/2017/payoneer-armor-payments-escrow-b2b-ecommerce-buyer-supplier-transaction-transfer-b2c-b2b-payments-amazon/
- https://www.digitalcommerce360.com/2017/04/18/b2b-e-commerce-marketplace-ec21-launches-payoneers-escrow-solution/
- https://www.finextra.com/blogposting/14077/escrow

Trend 11: Cryptocurrency in cards

- https://cointelegraph.com/category/market-analysis
- https://www.pymnts.com/tag/libra/
- https://en.wikipedia.org/wiki/Libra_(cryptocurrency)
- https://coinfunda.com/bitcoin-debit-card/
- https://coin.dance/stats
- https://hackernoon.com/five-real-machine-learning-use-cases-in-cryptocurrencies-y51x33gw
- https://hackernoon.com/how-merging-ai-with-blockchain-can-create-a-more-secure-environment-for-data-sharing-a63ac0e2389e
- https://cards.crypterium.com/learn/pros-and-cons-crypto-debit-cards
- https://www.bitcoinmarketjournal.com/bitcoin-debit-card/
- https://news.bitcoin.com/cut-off-here-are-7-different-bitcoin-debit-card-services-and-fees/
- https://news.bitcoin.com/spend-10-cryptocurrencies-with-these-debit-cards/
- https://medium.com/@slavasolodkiy_67243/crypto-friendly-cards-suck-a-new-analysis-illustrating-their-weaknesses-in-detail-5619b27c88ed
- https://www.barchart.com/crypto/market-capitalizations
- https://www.cfo.com/payments/2019/12/the-5-biggest-trends-in-cryptocurrency-for-2020/
- https://www.hexaresearch.com/research-report/cryptocurrency-market
- https://cointelegraph.com/news/coinbase-card-adds-xrp-and-launches-in-10-more-european-countries
- https://www.investopedia.com/tech/coinbase-what-it-and-how-do-you-use-it/
- https://www.marketsandmarkets.com/Market-Reports/cryptocurrency-market-158061641.html
- https://www.accountingtoday.com/list/4-cryptocurrency-trends-for-the-next-5-years

Trend 12: Multicurrency cards for corporate travelers and tourists

- https://www.pymnts.com/news/payment-methods/2019/visa-partners-with-revolut-to-introduce-multi-currency-debit-card/
- https://www.revolut.com/
- http://transumo.com/best-travel-card/
- https://transferwise.com/
- https://n26.com/en-eu
- https://www.forbes.com/sites/bishopjordan/2017/03/20/n26-review
- https://www.axisbank.com/retail/forex/travel-forex-card/multi-currency-forex-card
- https://www.hdfcbank.com/personal/pay/cards/forex-cards/multicurrency-platinum-forexplus-chip-card
- https://markets.businessinsider.com/news/stocks/wirecard-and-ctrip-china-s-largest-travel-company-launch-multi-currency-visa-travel-cards-1027846195

Infosys contributors

Rajneesh Malviya
Senior Vice President, Financial Services

Ashok Hegde
Vice President, Financial Services

Vijay Anand
Head, Cards and Payments, Financial Services

Each contributor below is a consultant in the cards and payments competency area.

Vaibhav Bhokare

Warsha Borde

Rahul Chidipothu

Neelmani Choudhary

Elbin Elias

Rashmi Hulsurkar

Pankaj Jayswal

Kaustav Lahiri

Jennifer Mariasoosai

Dhiren Mehta

Vaibhav Pathak

Krithika Ragunathan

Manickavasagam S

Nakul Seth

Ashutosh Sharma

Producers

Samad Masood
Infosys Knowledge Institute
London

Sharan Bathija
Infosys Knowledge Institute
Bangalore

About Infosys Knowledge Institute

The Infosys Knowledge Institute helps industry leaders develop a deeper understanding of business and technology trends through compelling thought leadership. Our researchers and subject matter experts provide a fact base that aids decision making on critical business and technology issues.

To view our research, visit Infosys Knowledge Institute at infosys.com/IKI