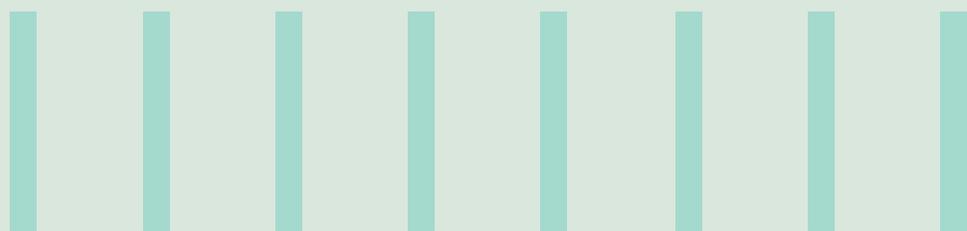




CHALLENGES AND OPPORTUNITIES FACING GLOBAL CARD NETWORKS



Abstract

In recent years, major Card markets such as US and Europe have witnessed regulations that intend to regulate interchange fees and promote competition. In countries like China, India and Russia, Domestic Card Network were launched with the support of Central bank; government policies led to raise in significance of these networks domestically. There is a growing interest in Real Time Payments across the globe and incumbent card players have evinced interest due to its potential to emerge as a viable alternative to Card networks. FinTech players are disrupting the ecosystem with innovative solutions in specific layers of payments value chain. Global card networks are taking a Collaborate and Compete approach to manage this onslaught of Fintech disruptions.

1. Introduction

The global cards landscape is dominated by a select set of Global Card Network companies that have a widespread presence in terms of Cards issuance and merchant outlet acceptance across the globe. North America, Europe and few countries in Asia have well-developed card markets and these markets are dominated by the Global Card Network duo of Visa and MasterCard. Global Card Network companies (Visa, MasterCard, UnionPay, American Express, Discover / Diner Club and JCB) collectively generated purchase volume of USD 20.4 Trillion in 2015 across credit, debit and prepaid cards (Nilson Report, 1102, Jan 2017). U.S (23.4%), Asia Pacific (55.9%) and Europe (14.5%) contributed the major share of this purchase volume. In terms of number of cards in circulation (Credit, debit and

prepaid cards) in 2015, the three top Global Card Networks - UnionPay (5.44 Bn), Visa (2.97 Bn) and MasterCard (2.31 Bn) had 59% share of the worldwide total of 18.08 Billion (Nilson Report, 1094, Sep 2016).

In recent years, major Card markets such as US and Europe have witnessed regulations that intend to regulate interchange fees and promote competition. In countries like China, India and Russia, Domestic Card Network were launched with the support of Central bank; government policies led to raise in significance of these networks domestically. There is a growing interest in Real Time Payments across the globe and incumbent card players have evinced interest due to its potential to emerge as a viable alternative to Card networks. FinTech players are disrupting the ecosystem with innovative solutions in specific layers of payments value chain. Global

card networks are taking a Collaborate and Compete approach to manage this onslaught of Fintech disruptions.

2. Onslaught of Regulations that intends to promote competition

In recent years, US and European markets have witnessed regulations on interchange fees and transaction routing. These regulations were passed with the objective of providing increased choices to consumers and merchants on how the card transaction is routed and thereby increase competition in the marketplace. Interchange fees (a component of Merchant Discount Rates) and transaction routing flexibility has been the grouse of merchants for a long time in various countries across the globe.

Durbin Amendment	Durbin Amendment capped the interchange fees for debit card instruments at 21 cents plus 5 basis points of transaction amount (one more cent is added if Issuer implements certain fraud-prevention measures). Smaller Issuers (Bank with assets lower than USD 10 Billion) are exempted from Interchange cap. Durbin amendment also mandated that Debit card issuers will have to place two unaffiliated network brands on every debit card (one signature and one PIN network) thereby providing merchants with increased choice in routing the transaction to Issuing bank.
Regulations in Europe	European Interchange Cap restricts the interchange fees for debit and credit card transactions in the European Economic Area to 0.2% and 0.3 % of the transaction value respectively. The regulation also enabled Co-badging (whereby a credit or debit card can carry more than one card network brand). This will enable consumers and merchants to choose the payment network to be used for transaction processing at point of sale (Merchant can set a priority but consumer's choice will prevail).
PSD2 Initiative in Europe	The Second Payments Service Directive (PSD2) planned to go live in Jan 2018 envisages new set of third party players such as Payment Initiation Service Provider (who can initiate a payment transaction using a payment account held in a different bank) and CISP (payment service provider issuing card-based payment instruments who can issue cards that leverages a payment account held with a different bank). PSD2 will enable players in ecosystem to process card transactions at merchant outlets without depending on the existing Card network players.

3. Increasing prominence of Domestic Card Networks

Domestic Card Networks have been around for a long time in many countries. Many of them are debit only networks

while some of them support both credit and debit cards. A sample list of Domestic Card Networks across the globe is mentioned below. Many of these networks were started to support ATM transactions and evolved to accept merchant outlet

transactions. In countries like China, India and Russia, the support from their Central bank and the Government policies led to raise in significance of the Domestic Card Network.

India	<p>National Payments Corporation of India (NPCI) is the umbrella organization for all retail payment systems in India. NPCI was incorporated with support of India's Central bank (Reserve Bank of India) and Indian Banks' Association. RuPay (India Domestic Card Network that supports both Credit card and Debit card issuance) was launched by NPCI with an objective of reducing the dependence on Global Card Networks.</p> <p>RuPay card issuance got a boost after the Indian Government initiated Jan Dhan Yojana scheme to promote issuance of zero balance no-frill bank accounts for the unbanked segment (rural Indians and economically weaker section). 300+ Million RuPay Cards have been issued till date and they are predominantly Debit Cards. RuPay supports EMV cards and contactless cards. RuPay has tied-up with Discover Networks to ensure global acceptance of RuPay branded Cards.</p>
Russia	<p>Russia's central bank set up National Card Payment System (NSPK) to provide the necessary infrastructure for domestic card processing. All domestic transactions in Russia including those made with cards issued on Global Card Networks are currently processed through the NSPK infrastructure. NSPK also operates Mir Cards (domestic Payment System). 5+ Million Mir Cards have been issued by 60+ banks in Russia and this is expected to grow to 120+ Million by 2019.</p>
China	<p>China UnionPay (CUP) was established as a Bank Card association by major Chinese banks with the objective of unifying the card processing capabilities, grow the size of card base and increase the penetration of ATMs / POS terminals in China. CUP rode on the back of China's economic growth to amass a card base of 5 billion cards making it the largest card network globally in terms of number of cards issued but still trails Visa and MasterCard in terms of number of transactions globally.</p> <p>CUP increased the spread of its international network to meet the needs of Chinese overseas travelers and to enable Chinese commercial banks to expand their services abroad. 65 institutions in 17 overseas countries have issued 46 Million+ UnionPay card locally. UnionPay cards are accepted in 26 million stores in 150 countries. UnionPay is a good example of a Domestic Card Network with the right environment and support emerging as a strong alternative to incumbent Global Card Networks.</p>

Sample List of Domestic Card Networks

ANZ	Eftpos (Australia), Eftpos (New Zealand)
North America	US PIN Debit Network (Star, Accel, NYCE, Jeanie, Presto, Shazam), Interac (Canada).
Europe	Girocard (Germany), Carte Bancaire (France), PostFinance (Switzerland), Multibanco (Portugal), Eufiserv (Pan Europe ATM), BCC (Belgium), Bancomat Mister Cash (Belgium), Nets (Nordic / Baltic), UPC (Ukraine), DIAS (Greece)
Middle East	GCC Net (pan Middle East), BENEFIT (Bahrain), UAE SWITCH, OMAN NET, KNET (Kuwait), NAPS (Qatar), SPAN (Saudi Arabia), Shetab (Iran).
Latin America	Elo (Brazil), Prosa (Mexico), Redcompra (Chile).
Asia	BC Card (South Korea), Smartlink (Vietnam), VNBC (Vietnam), Bancnet (Philippines), MegaLink (Philippines), NEPS (Nepal), Altyn Asyr (Turkmenistan), APS (Afghanistan).
Africa	InterSwitch / Verve (Nigeria), Monetique (Tunisia), EthSwitch (Ethiopia)

4. Growing Interest in Real Time Payments and its potential for emerging as a viable alternative to Card networks

There has been increased interest in Real Time Payments across the globe. Real

Time Payments are domestic inter-bank payments that are settled in real time or near real time. The funds are made available to beneficiary in couple of minutes. More than 10 countries across the globe have already adopted Real Time Payments. Japan, Switzerland, South Korea are good examples in terms of adoption

(Real time payment volume as a % of total payment volume). IMPS in India and Faster Payments in UK are two good examples of how Real Time Payments can be potentially harnessed to transform the merchant payment landscape.

<p>India's IMPS / UPI</p>	<p>Unified Payments Interface (UPI) from NPCI enables customers to pay using virtual user IDs and supports both push & pull payments at merchant outlets. UPI leverages IMPS for settlement processing (IMPS - Immediate Payment System is India's Real Time Payment system). Retail banks, Payments Bank and digital wallet service providers in India participate in UPI Payments. Consumers have the choice to use the mobile payment app provided by any of the players in UPI eco-system (the entity providing banking account service and entity providing UPI Payment services to the consumer can be different).</p> <p>'UPI on POS' enables Merchant POS terminal to generate a QR code that can be scanned by the consumer's mobile phone to initiate a "Person to Merchant" payment. Merchant discount rate for POS based UPI transaction is 0.25% for payments below Rs 1,000 and 0.65% for all other charges. Considering that UPI's merchant discount rates are lower than card based transactions and merchant bank account is credited in real time, UPI Merchant payments can grow to become a compelling alternative to existing card network based transaction processing.</p>
<p>UK's Faster Payments</p>	<p>Faster Payments (UK's real time payments) is operated by VocaLink (VocaLink was acquired by MasterCard in 2017). VocaLink's Zapp is a "Pay by Bank app" service that enables consumers to use any banking mobile app for online payments and payments at merchant outlets. Currently "Pay by Bank app" service is available on Barclay's Pingit (Customer can use "Pay by Bank app" through Pingit regardless of the bank in which they hold their bank account) and on HSBC bank's mobile app. Zapp is working with various UK banks for expanding this service to all bank customers.</p>

Australia real time payment named New Payment Platform (NPP) is planned for launch in later part of 2017. NPP has been designed to support Value Added Services such as supplier payments, insurance payouts, payroll, P2P, utility bill payments etc. NPP can be potentially extended to payment at merchant outlets. In the European Region, Instant SEPA Credit Transfer is expected to launch in early 2018. PSD2 initiative coupled with Instant SEPA Credit Transfer can transform the merchant payment landscape and can potentially evolve as an alternative to existing card networks.

Real Time Payments is gathering momentum in US market as well. EarlyWarning and clearXchange along

with consortium of their owner banks (Bank of America, BB&T, Capital One, JPMorgan Chase, U.S. Bank and Wells Fargo) are working on real-time payments processing initiative. Apart from this, various players such as The Clearing House, FIS and VocaLink have Real Time payments initiative for the US market.

5. Global Card Networks are increasing their focus on Value Added Services

Card transaction routing, clearing & settlement services, stand-in process, authorization & authentication services have become industry standard. Card Network support for EMV, contactless

payments and Mobile NFC transactions has become commonplace. To differentiate their services, Global Card Networks such as Visa, MasterCard and American Express have increased their focus on Value Added Services. Such initiatives also enable Global Card Networks to strengthen their value proposition to the key stakeholders in the ecosystem – Cardholder, Merchant, Card Issuer and Merchant Acquirer. Key focus of Global Card Networks in this regard are in areas such as Loyalty & Dynamic Offers, Digital Solutions, Analytics & Insights, Fraud Management, Consumer Alerts / Settings and Money Transfer Services.

Loyalty & Dynamic Offers

MasterCard EasySavings	MasterCard EasySavings Program is a merchant-funded, MasterCard-managed, automatic rebate program for small / medium sized Merchants who may not have the wherewithal to run their rewards program.
Visa Loyalty Platform Services	Issuer can harness Visa Loyalty Platform Services to run the Loyalty Program for their card base. With Visa Offers, merchants, acquirers, and issuers can use VisaNet data to develop and deliver relevant offers to consumer. Visa Integrated Redemption Platform provides issuers, merchants, loyalty providers, and acquirers a tool for enabling the redemption of offers, rewards, discounts, deals, and loyalty at the point of sale.

Digital Solutions

Visa Advertising Solutions	Visa Advertising Solutions leverages digital advertising data from Oracle's Data Cloud (Data driven marketing services) and aggregated & de-identified purchase data from Visa. Companies can tailor their advertising campaigns to different audiences and serve up the most relevant offers.
MasterCard Digital Enablement Services (MDES)	MDES supports contactless payments at point-of-sale by leveraging NFC technology. MDES also supports Digital Secure Remote Payments (DSRP), whereby consumers can make in-app purchases using a token. MDES enables ApplePay transaction (NFC and in-app) and also leverages MasterCard Tokenization Services.
Visa Commerce Network	Visa Commerce Network works by connecting transactions between two merchants on Visa's payment network. For example, a hotel booking site can connect its Visa customers to local restaurants to offer discounts or integrated travel perks when shopping at these stores.
Visa Checkout	Visa Checkout is a Digital Wallet solution. Cardholders can link their Visa Credit / Debit / Prepaid cards into the wallet. Customers sign in to Visa Checkout account using their email id and password and pay for their online transactions.
American Express Network Token Services	American Express, MasterCard and Visa offer Network Token Services as on-behalf-of (OBO) issuance services. The service includes payment token generation, provisioning, processing, and lifecycle management at the payment network level.
Visa Consumer Authentication Service	Visa Consumer Authentication Service enables Card issuers to reduce the risk of eCommerce fraud using real-time, risk-based transaction analysis. It seamlessly works with 3-D Secure programs such as Verified by Visa.

Analytics & Insights

MasterCard Advisors	MasterCard Advisors service leverages data-driven consumer insights and provides strategy and advisory services to Card Issuers and Merchant acquirers. Advisory services are offered in areas such as customer acquisition, card activation / usage, customer retention, cross-selling and balance building and portfolio analytics.
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<p>Visa Transaction Advisor (VTA)</p>	<p>VTA harnesses power of analytics and transaction processing scale of Visa to identify risky transactions. VTA became a game-changer in fighting fraud at self-service fuel pumps (Gas stations) which used to be easy targets for criminals.</p>
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Fraud Management

<p>MasterCard Expert Processing System (EPS)</p>	<p>EPS evaluates risk score for every transaction processed by MasterCard. EPS uses Artificial Intelligence (AI), smart agent technology and business rules to generate fraud score in real-time during authorization routing in milliseconds.</p>
<p>Visa Mobile Location Confirmation (MLC)</p>	<p>Visa tied up with Finsphere Corporation (provider of mobile data and geo-spatial analysis) to launch MLC Services. MLC uses mobile geo-location information to reliably predict whether it is the account holder or an unauthorized user making a transaction on the Visa card.</p>
<p>MasterCard Alerts (Mobile geo-location)</p>	<p>MasterCard has partnered with Zumigo to offer cardholders with a mobile app-based solution that delivers location alerts triggered by pre-set digital boundaries whenever cardholders travel domestically and internationally.</p>
<p>American Express Charge Verification Program (CVP)</p>	<p>For successfully authorized Card Not Present transaction above 200 USD, Merchant can call up American Express and request for CVP. Amex will attempt to call the cardholder to confirm the transaction in three working days.</p>
<p>Visa Travel Authorization Tag</p>	<p>Visa Travel Authorization Tag allows issuers to identify when a cardholder is traveling based on airline, rail, cruise or hotel purchases made with their Visa account. Travel information is then integrated into Visa's risk scoring engine.</p>
<p>American Express Identity Defence Platinum (IDP)</p>	<p>IDP offers cardholders with information and tools to keep them aware of threats to their identity. For a monthly fee, cardholder gets facility for Credit monitoring & alerts and Identity theft risk assessment services.</p>
<p>Visa Risk Manager (VRM)</p>	<p>VRM enable Card Issuers to establish and manage rules for real-time fraud management. These rules are used by Visa Advanced Authorization system.</p>

Consumer Alerts / Settings

<p>MasterCard inControl</p>	<p>MasterCard inControl enables cardholders to set spending limits and controls on payment accounts to determine exactly where, when, and how their cards are used.</p>
<p>Visa Consumer Transaction Controls (CTC)</p>	<p>Visa Consumer Transaction Controls (CTC) enables issuers to offer their cardholders the ability define spending limits, prohibit international transactions or temporarily suspend their card's use if ever misplaced or stolen.</p>

Money Transfer Services

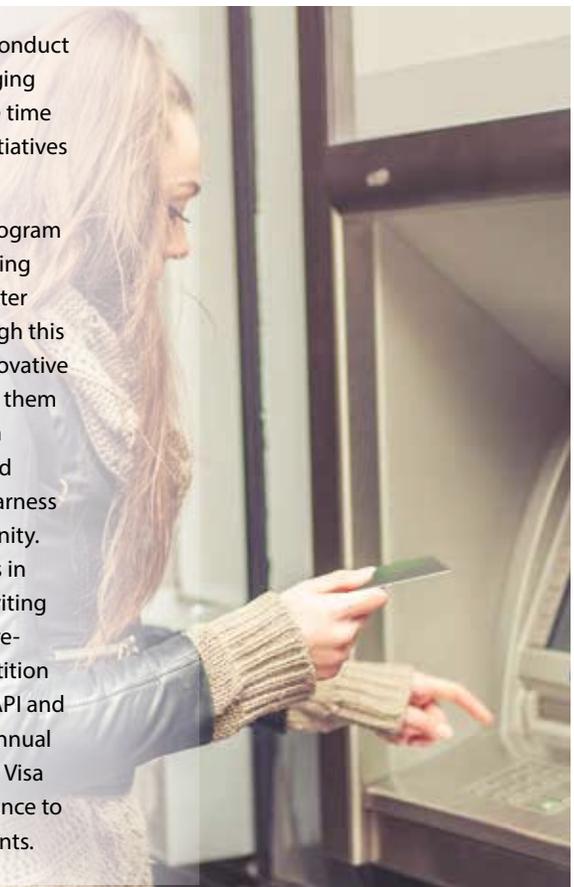
MasterCard MoneySend	Consumers can send and receive funds using MoneySend. It supports domestic and international money transfer that can be initiated online or through a mobile text message.
Visa Direct	Visa Direct enables cardholders to transfer funds to individuals. Cardholders can send remittances from any source — a bank, a card, or cash — to another eligible cardholder. The funds are credited to the recipient's Visa account and can be spent directly from their card or withdrawn as cash.

6. Disruption from FinTech – Card Networks are taking a Collaborate and Compete approach

With several economic, demographic, regulatory and technological factors in play, the Cards & Payments industry is witnessing rapid innovation cutting across the value chain. FinTechs continue to disrupt this space with integrated developments across emerging technology trends such as IoT, Biometrics, APIs, Social Payments, Wearables, Blockchain - to name a few. FinTech players are providing innovative solutions in specific layers in payments value chain; these Innovations are expected to improve the customer experience and reduce the friction in the payments ecosystem. Global Card Networks are approaching the challenges thrown by Fintech firms by adopting a Collaborate and Compete approach. Card Networks are increasing their focus on

in-house innovation initiatives to conduct proof of concept trials using emerging technology trends and at the same time working with Fintechs on many initiatives that involve emerging technology.

MasterCard launched Start Path program in 2014 to work with startups, helping them scale their operations and enter new markets and industries. Through this initiative, MasterCard supports innovative early-stage startups and work with them on developing the next generation of payment solutions. Visa launched 'Everywhere Initiative' in 2015 to harness the capabilities of start-up community. Visa conducts annual competitions in San Francisco and Barcelona by inviting start-up firms to compete under pre-defined categories. Annual competition in 2017 covered topics across IoT, API and Event Commerce. Winners of the annual competition gain mentorship from Visa industry experts and also get a chance to present their solutions to Visa's clients.



Internet of Things / Connected Commerce

MasterCard and GM 'Onstar Go'	By embedding Masterpass digital wallet within 'OnStar Go' (a Cognitive Mobility Platform from IBM and General Motors), MasterCard will enable car drivers and passengers to make payments at Fuel outlets, Service centers etc. using the display screen on the car's dashboard.
Visa and IBM Watson IoT	Visa and IBM are enabling payments through IoT by leveraging IBM's Watson IoT Platform and Visa's Tokenization services. 6,000+ companies on Watson IoT Platform can provision Visa payment tokens into their devices and turn them into payment terminals that allow users to pay on the go.
Smart Refrigerator	Samsung and MasterCard have launched a smart refrigerator that allows users to order groceries / vegetables and pay on a touchscreen embedded on the refrigerator door.

Biometrics

MasterCard's 'Identity Check Mobile'	MasterCard's 'Identity Check Mobile' enables Biometrics based Online Payments using fingerprints or facial recognition. This simplifies online shopping on mobile phone.
Visa enabled Biometrics ATM	Visa's specification for biometrics (palm, voice, iris, or facial) with chip card is designed to work with the EMV standard to ensure interoperability. Visa and Absa Bank in South Africa have launched ATMs that support fingerprint.
MasterCard's Biometric card at POS	MasterCard's biometric card combines EMV chip technology with fingerprints to verify the cardholder's identity for in-store purchases. MasterCard had tied-up with Safran (Morpho) for the software for biometric authentication.

APIfication of Payments

Visa Developer Program	Visa Developer Program enables partners / start-ups to leverage Visa network assets that are available as Application Programming Interface (API) services. Developers can access the API specification and sandbox testing facility available in the API developer portal.
MasterCard API platform	MasterCard API platform includes a 'New and Experimental' API category that enables partners to harness emerging technologies such as Augmented Reality, Virtual Reality and the Internet of Things.

Digital Payments / Social Payments

MasterCard support for Social Payments	As part of Star Path program, MasterCard works with PayKey, a startup that enables payments within any social network. PayKey enables banks to integrate their mobile banking app to facilitate financial transactions while customers remain in a social network session (like Facebook) or messaging app (like WhatsApp).
ApplePay	Apple collaborated with MasterCard, Visa and American Express for launch of ApplePay in US market. Tokenization Services from MasterCard, Visa and American Express are used by ApplePay.
Token reciprocity	In Dec 2016, MasterCard and Visa entered in to a reciprocal agreement to support Token interoperability across both their networks. This would allow consumers to load Visa branded card in to MasterCard digital wallet and vice-versa.
Apple Siri	Discover cardholders can use Siri to pay balances through the Discover mobile app.

Wearables

Visa and SWATCH tie-up	Visa and SWATCH have launched “pay-by-the-wrist” watch with a built-in NFC chip that allows transactions at contactless POS terminals.
MasterCard partnership with Coin	MasterCard has partnered with Coin Inc to implement payment facility in to wearable such as advanced fitness trackers, smart watches etc.
Turnkey services for Wearable Payments	G&D Mobile Security provides turnkey services for deploying smart wearable payment devices (watches, bands, rings and fobs) by leveraging Visa and MasterCard Token Platforms.

Blockchain / Distributed Ledger

Visa's collaboration with Chain Inc	Visa's blockchain based platform 'B2B Connect' enables banks to process B2B international payments globally. This platform is based on Chain Core (an enterprise blockchain infrastructure from Chain Inc that supports private blockchain networks).
MasterCard and Everledger	As part of Star Path program, MasterCard works with Everledger, a startup that harnesses blockchain technology to track and protect diamonds and other luxury goods on their lifetime journey.



7. Conclusion

Domestic Card Networks are expected to grow their market share in Debit instruments with support of their Central bank and local governments. Geo-political and economic trends can further accelerate this journey. However, Global Card Networks will continue to hold their sway over Card Network transaction based payments landscape. Global Card Networks' increased focus on Value Added Services, breadth of their product / service offerings and depth in their understanding of the marketplace will come in handy as they consolidate their marketshare in business segments with higher profit potential such as Corporate Cards, Travel & Entertainment segment, cross-border payments and high-end card products such as Platinum and Black.

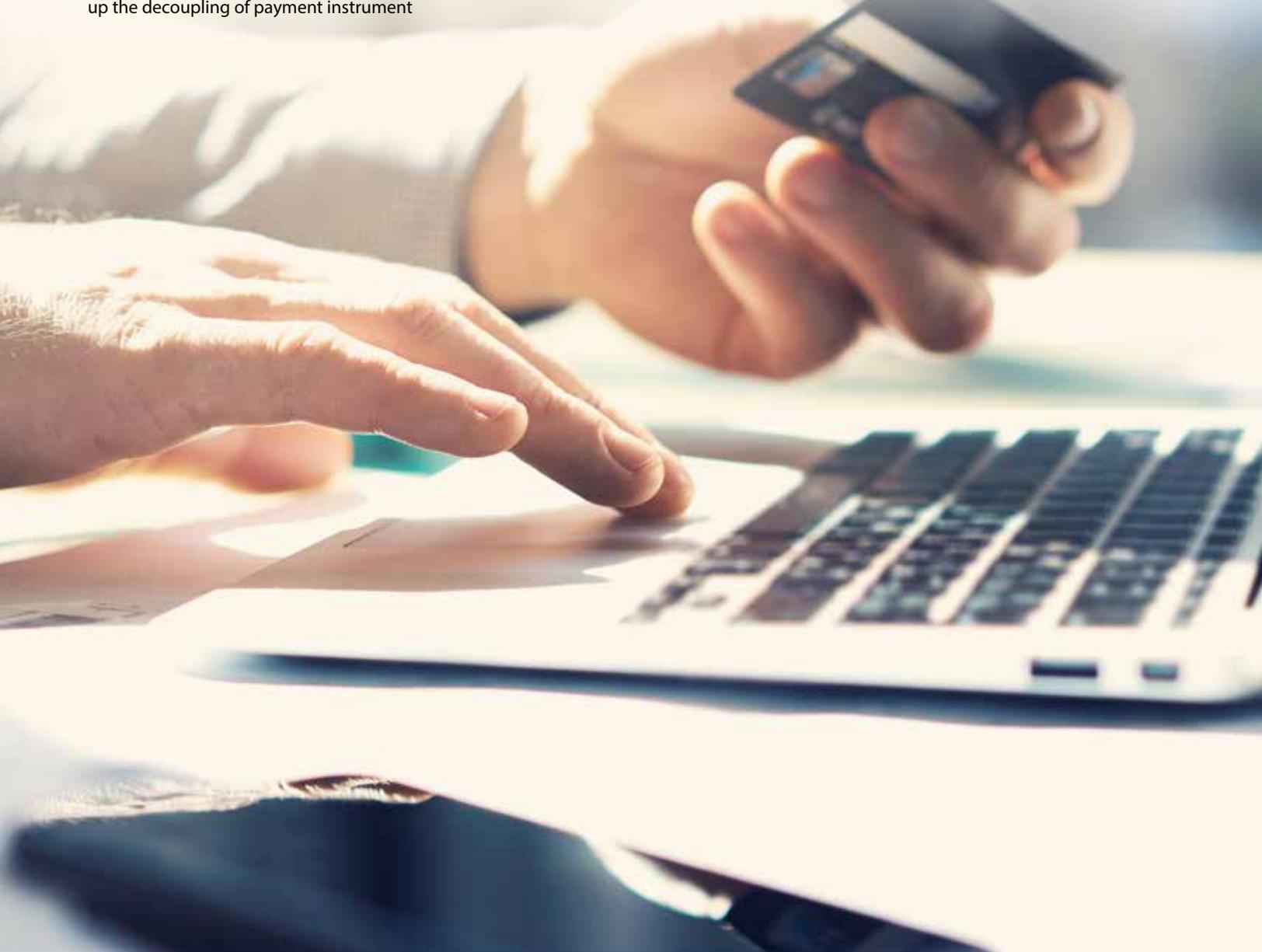
Adoption of mobile payments is speeding up the decoupling of payment instrument

(form factor) and account used (source of fund). Fintechs and new players promoted by initiatives such as PSD2 in Europe and UPI in India are expected to gain marketshare by offering better customer experience and by reducing friction in existing payment rails. Increased adoption of Real Time Payments in markets with developed bankcard industry will lead to adoption of alternative payment rails for payments at merchant outlets. Support from Central banks and payments industry association would accelerate adoption of such alternative payment rails.

FinTech firms will increase their focus on Global Card Networks' business segments that have higher profit potential and come up with alternatives that provide increased value proposition to the stakeholders. FinTech focus on Cross-border payments is a good example of this. The other focus area for FinTech firms would be business

segments that are not adequately served by existing Card Network / Banking ecosystem. FinTech focus on alternative platform for low ticket lending for unbanked and customers with no credit history / poor credit history is a pertinent example of this approach. FinTech focus on low value payments / low value P2P transfers by leveraging closed loop prepaid network or mobile telecom billing is also a case in point.

Global Card Networks will continue to follow a Collaborate and Compete approach with Fintechs to keep up the momentum and hold on to their marketshare. As emerging technology trends (wearables, IoT, Biometrics etc.) become mainstream in payments industry, Global Card Networks will be well positioned to ride the transformational journey of the payments industry in the coming years.





About the Author

Manickavasagam is a Principal Consultant with Cards and Payments Practice at Infosys. He has 18 years of experience in Cards and Payments domain. He has been involved in various consulting assignments and platform implementation initiatives in Credit card platforms, Loyalty servers, eCom Payment Gateways, Card Customer Service platforms and Prepaid Card processors.

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