



Successfully deploying Digital Payments in a Global Economy

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Global Opportunities

- Reduce global economy friction, leading to...
 - · Increased spending on goods and services,
 - Greater selection,
 - Lower cost structure, and
 - Positive customer experience
- In turn, creating a virtuous economic cycle whereby...
 - · Increased consumption translates into increased production,
 - More jobs,
 - · Higher incomes, and
 - Greater economic prosperity
- Trust in electronic transactions further drives consumption...evolving digital payments provide consumers greater recourse for fraudulent transactions





Global Decisions

- How to enable global commerce across both mature and emerging payment schemes
 - Everything to everyone?
 - Current customers and current payment choices?
 - Proprietary or open networks?
- How will networks and schemes evolve?
 - Local Clearing
 - SEPA
 - Cross Border Delivery
 - Faster Payments
 - ISO20022





What's Next?

- Remain customer focused and reduce friction, while building scale and efficiency
- Adapt and be nimble to rapidly changing technology and payment schemes
- Eliminate risk and operate within changing regulatory frameworks

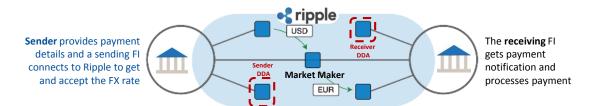
Blockchain crypto-processing is solving interoperability & data challenges across geographies



Benefits: Secure, Inexpensive, Fast Transfers in Any Currency

- What it is:
- Utilizes a cloud-based ledger interconnecting the world's disparate financial systems
- Enables international movement of funds while riding the rails of existing infrastructure

Ripple – One Example of Blockchain processing:



A market maker holds the both the sender and receiver's currencies and facilitates the transaction



A blockchain is a cryptographic, or encoded, ledger comprising a digital log of transactions shared across a public or private network*



What does the blockchain actually do?

- Allows for digitization of assets
- Enables bilateral transactions between network participants
- Distributes validation of transactions among multiple network participants
- Leverages cryptographic techniques in managing assets and ownership on the ledger

What problems could it solve?

- ✓ Reduce the need for a trusted 3rd party
- ✓ Eliminate centralized systemic risk
- ✓ Prevent fraudulent activity
- ✓ Improve inconsistent data quality & governance



Disruptors

Customized payment networks will start to emerge to address specific payment needs

Emerging customizable cloud-based global payment networks



Local Alias-based payment networks that have solved geographic interoperability challenges



Apple Pay

A wireless system that lets owners of iPhones to pay for goods at retailers with payment terminals



2,500 Financial institutions now support Apple Pay as well as some 700,000 retail locations



In January 2015, Apple Pay accounted for TWO OUT **OF THREE** dollars spent via contactless payments



MILLENNIALS are the most likely to use a smartphone to make a mobile payment

This year, COCA-COLA PLANS TO DEPLOY UP TO 100,000 VENDING MACHINES that will accept Apple Pay



































Bitcoin

A digital cryptocurrency that is simultaneously a cryptographic protocol and a virtual currency which gives consumers a way to exchange money for free or a nominal fee

In 2014, the price of Bitcoin **OPENED THE YEAR AT**



This represents a **DROP OF MORE THAN 50%**from the start of the year

By mid-December, it was trading in the MID-\$300 RANGE

The number of Bitcoin ATMs as of March 3, 2015

111

61

20

20

13

THE UNITED STATES

CANADA AUSTRALIA

THE UNITED KINGDOM

FINLAND

About 93% of the cryptocurrency's users are MALE

A study found that most Bitcoin users were grouped in the states of California, Utah, Oregon, Washington, Nevada, New Hampshire and Vermont

MILLENNIALS ARE MORE LIKELY than any other age demographic to use digital currencies now and in the future – 13% use them today and 26 project using them by 2020





Future Forms of Payment

BIOMETRICS



VEIN PATTERN

Payment methods that rely on a palm's unique vein pattern for authentication



VOICE RECOGNITION & FINGER VEIN

Barclays is introducing voice recognition for users of its telephone banking service as well as finger vein biometric scanners

APPLE WATCH



Available starting April 2015

The user **DOUBLE TAPS** the side button on the Apple Watch and holds it near an NFC to pay



SOCIAL MEDIA



There is an idea to enable consumers to acquire products or discounts with social media actions **IN LIEU OF CASH**



Instragram users with at least **500 FOLLOWERS** are eligible to pay at participating businesses by posting photos of the purchase

The number of products available for this type of exchange increases in proportion with the number of followers



Safety

VIRTUAL CURRENCY

Percentage of American who are very concerned about potential fraud with each of the following forms of payment



TAPPING TO PAY WITH A MOBILE PHONE



A MOBILE APP





It is possible to trace Bitcoin transactions although it may be **DIFFICULT TO ASSOCIATE A TRANSACTION WITH A PARTICULAR INDIVIDUAL**



THE CRYPTOGRAPHY

used in Bitcoin is military grade and the blockchain IS BELIEVED TO BE SECURE

Apple Pay Transactions are secured by means of



Storing users credit card information directly on their iPhones IN A SPECIALLY DESIGNED CHIP AND THEN GENERATING PROXY ACCOUNT numbers that it provides to retailers



A uniquely generated code



Fingerprint authentication



In Venmo, **ALL DATA IS SENT OVER A 256-BIT ENCRYPTED CONNECTION** – the same encryption method used to protect classified government information – and transactions are protected by the Federal Deposit Insurance Corporation



Regulations



BITCOIN transactions are extremely difficult to trace and so, they are considered **IMMUNE TO TAXATION** and currency control by governments



ANTI-MONEY LAUNDERING LAWS,

for example, **ARE OBSOLETE** when it comes to overseeing Bitcoin

These laws were originally written for banks before virtual currencies existed and are outdated



In March 2013, the **AMERICAN INTERNAL REVENUE SERVICES DECLARED BITCOIN 'PROPERTY',** for tax purposes, and not a currency in the traditional sense

In late 2013 and early 2014, a number of nations took steps to ban or at least strictly limited virtual currencies



THAILAND WAS FIRST



The Peoples Republic of China PROHIBITED BANKS in the country from DEALING IN VIRTUAL CURRENCY



The Danish Financial Supervisory Authority has gone on record WARNING AGAINST the use of these NON-GOVERNMENTAL INSTRUMENTS



Russia's central bank published an official warning stating that BITCOIN TRANSACTIONS ARE ILLEGAL IN RUSSIA

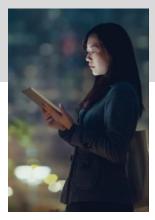


Disruptors

Mobile Adoption

Half of the world's population now has a mobile subscription. With an additional billion by 2020, taking the global penetration rate to 60%.¹

- Now 50.3% of ecommerce website traffic comes through a mobile device²
- In 2013, 95 million U.S. adults used mobile banking—27 million more than 2012³
- By 2018, 63% of the mobile consumer population is forecasted to be using mobile banking³



Mobile mindset⁴

Nearly half (44%) of Americans say they couldn't make it a day without their mobile device. Older millennials (ages 25-34) and Gen X (ages 35-49) are even more dependent on their smartphones.





DisruptorsAdoption of Digital Wallet

Digital or "e-wallets" are the fastest growing payment type globally

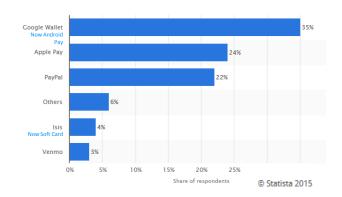
US Digital Wallet Payments¹

Transactional value and market share

2012 | \$295B / 17% 2017e | \$1,656B /41%

- They're easy to use
- Favored for digital content (books, music, games, etc.)
- Young shoppers are driving this growth
- Globally, Alipay and PayPal continue to dominate

U.S. Most Used Digital Wallets as of January 2015



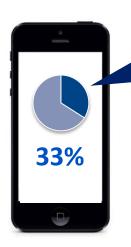




Disruptors

Adoption of Mobile Money Transfers

In the US, the number of mobile P2P users is expected to grow from 76 million adults in 2017 to 126 million (57% of all mobile device owners) by 2020.



Mobile P2P Transfers in 2016

Over a third of all consumers made a mobile P2P transfer in 2016



Transfer of funds from one person's bank account to another person's bank account via online/mobile using an email address or mobile phone number

Here's why:

- With mobile P2P you don't need the correct change, a paper check, or a nearby ATM
- Transactions are also fast compared to the time it often takes to wait for a check or bank transfer to clear
- Mobile P2P payments remove some of the stigma of asking for money—users can request money remotely



Companies from Six Different Industries are Influencing the Mobile Payments Conversation

Financial Institutions

Bank of Beijing (China)
Royal Bank of Canada (Canada)
BMO (Canada)
HSBC (UK)
Central Bank of Nigeria (Nigeria)
Barclays (UK)

ICICI Bank (India)
Reserve Bank of Zimbabwe (Zimbabwe)
Standard Bank (Kenya)

Retailers and Services

OpenTable, Starbucks, Amazon, eBay, Chipotle, Whole Foods



Payment Services (Mobile)

PayPal, LevelUp, Braintree, Venmo Sqaure, Clinkle UniteU Technologies Seamless Payments AB (Sweden) Kopo Kopo (Kenya, Rwanda, Tanzania)

Payment Services (Traditional)

MasterCard SinglePoint VeriFone

Wireless (Network Providers)

Rogers (Canada)
Teius (Canada)
China Mobile (China)
Deutsche Telekom (Germany)

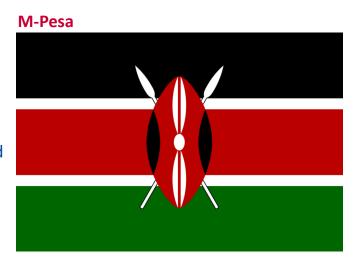
Verizon Vodafone (India) Payment Services (Traditional)

Apple, Google, Microsoft, Samsung, Xiaomi (China), Motorola, Broadcom



Kenya

- Product: Mobile payments—Vodafone and Safaricom Ltd.
- Uses: Pay rent, taxi, groceries. Intend to expand to pension payments, school fees, wages to workers, contract phones, water and electricity bills
- Launched in 2007. Expanded to other countries. India launched September 2013.









Single Euro Payments Area (SEPA)

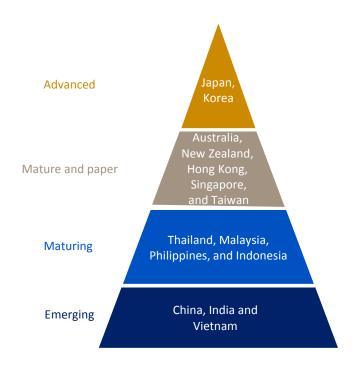
- "SEPA harmonizes the way we make and process retail payments in euro"
- SEPA enables customers to make cashless euro payments to anyone located anywhere in Europe, using a single payment account and a single set of payment instruments.
- SEPA Credit Transfer (SCT)
- A payment initiated by the payer. The payer sends a payment instruction to his/her bank. The bank moves the funds to the receiver's bank. This can happen via several intermediaries.
- SEPA Direct Debit (SDD)
- A transfer initiated by the receiver via his/her bank. Direct debits are often used for recurring payments, such as utility bills. They require a pre-authorization ("mandate") from the payer. Direct debits are also used for one-off payments. In this case, the payer authorizes an individual payment.
- SEPA Card Clearing (SCC)
- > Debit cards allow the cardholder to charge purchases directly and individually to an account.
- > Credit cards allow purchases within a certain credit limit. The balance is settled in full by the end of a specified period. Alternatively, it is partly settled. The remaining balance is taken as extended credit on which the cardholder must pay interest.

	Major milestones since 2002
2002	Set-up of the EPC.
2007	Adoption of the Payment Services Directive (PSD) as the legal basis for SEPA.
2008	Start of SEPA credit transfers.
2009	Start of SEPA direct debits; deadline for national PSD implementation.
2010	- All bank accounts reachable for national direct debits must be "reachable" for SEPA direct debits. - Full EMV migration. - Certification framework for terminals.
2011	 Framework for card transaction processing. Charging principles for cards - guidance by the European Commission. Proof of concept that existing schemes for making Online Banking e-Payments (OBeP) can be made interoperable
2012	Regulation establishing technical and business requirements for credit transfers and direct debits in euro enters into force, establishing 1 February 2014 as end-date for migration to SEPA credit transfers and SEPA direct debits.
2014	European Commission adopted proposal to introduce an additional transition period of six months – until 1 August 2014. Approved by European Parliament.



Asia Market and Change

Classified into four broad categories



- In both countries the payment systems are considerably advanced, with the low-value clearing system also functioning as a highvalue clearing system. Both markets are characterised by a relatively low usage of cheques
- Standard payment methods, including check, RTGS, and GIRO. Though declining, cheques still commonly used and GIRO (ACH low-value transactions) continues to grow at a significant pace
- Cheques are still the most common form of payments in these markets with growing acceptance of ACH equivalent systems
- The three markets have vastly different payment instruments and regulations, but have the common theme of a constantly evolving clearing infrastructure



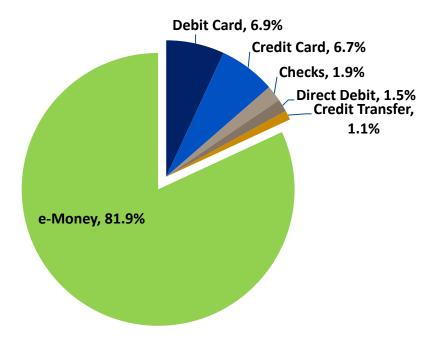
Fin-Tech Innovation in China

82.1% 支付宝 Alipay.com Of third party mobile payments by volume (2014) use Alipay Source: iResearch **50%** Of mobile phones are smartphones in China Source: IDC, LTP Analysis



Payments Market

Non-Cash Transactions in Singapore, by Payments Instrument, 2013





Brazil – Payments and Trends

- 5th Largest economy
- 52% of Latin America payments market share
- Cash accounts for 50% of domestic transactions
- Young population of sustainable growth
- Payment margins are attractive
- Central Bank and regulators support migration from cash to electronic payments and the use of banking services by unbanked
- Government the biggest player in payments. Aims at encouraging the use of pre-paid cards on social benefits distribution

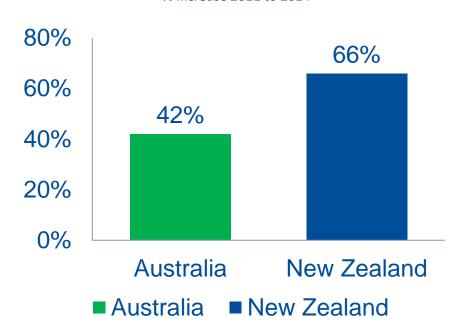




Australia and New Zealand

Commercial Card Spend Growth

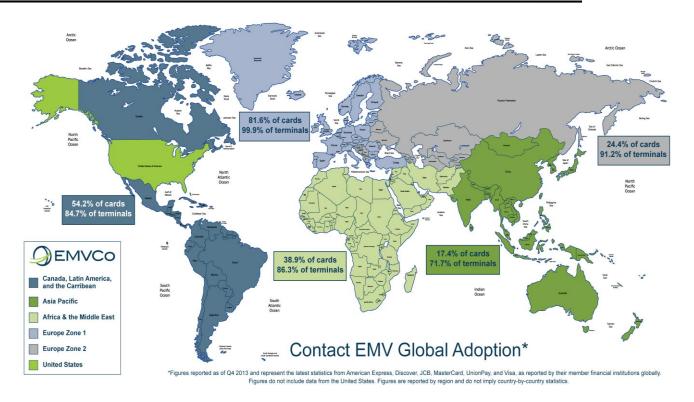
% increase 2011 to 2014













Anti-Money Laundering (AML)

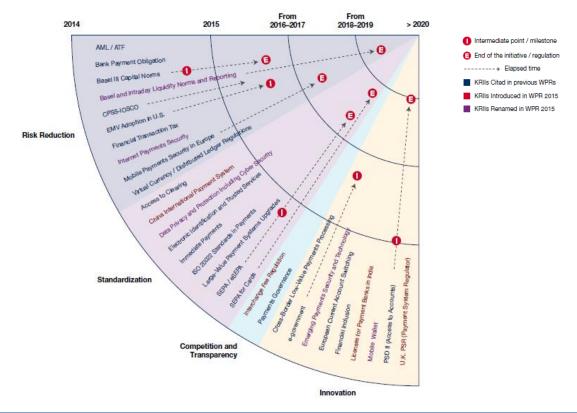
- Anti-money laundering (AML) is a term mainly used in the financial and legal industries to
 describe the legal controls that require financial institutions and other regulated entities to
 prevent or report money laundering activities.
- AML guidelines came into prominence globally after the September 11, 2001 attacks and the subsequent enactment of the USA Patriot Act.
- The long lasting implication of the enactment of the Patriot Act on broker-dealers, banks and other financial institutions is that they will be required to devote more resources than ever before to anti-money laundering efforts.
- The Patriot Act requires anti-money laundering compliance programs, suspicious activity reporting, verification of new accounts, certain recordkeeping for "correspondent accounts" with foreign banks, special due diligence for correspondent and private banking accounts, and correspondent accounts with foreign shell banks.





Regulations

Key Regulatory and Industry Initiatives Clustered by Regulators' Primary Objectives, 2017

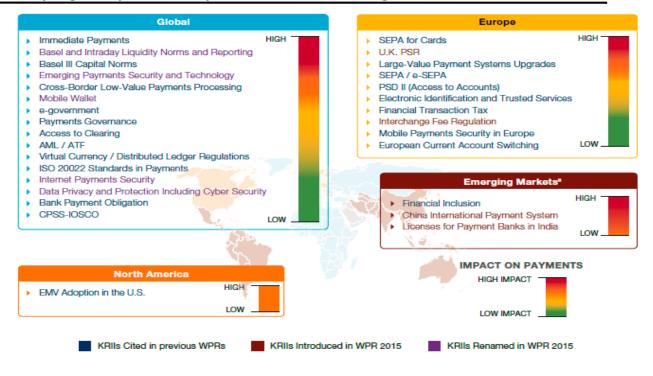






Regulations

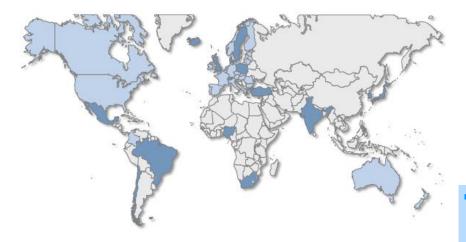
Heat Map of Key Regulatory and Industry Initiatives, Global and Regional 2017



CPSS-IOSCO – Committee on Payment and Settlement Systems (CPSS) and the Technical Committee of the International Organization of Securities Commissions (IOSCO); SEPA – Single Euro Payments Area ; Emerging Payments Security and Technology includes Contactless, Near Field Communication (NFC), Tokenization, Biometric authentication, and Mobile Point of Sale (mPOS); U.K. PSR – United Kingdom Payment Systems Regulator



Countries Around the Globe are Moving to Real Time Payments



Emerging/mature economies with real time low value settlement systems

45+

Markets recently announced their intention to do the same

In response to the global shift towards faster payments, The Federal Reserve has made the private sector build a Real Time Payments System as part of its 5 year strategic plan

- Some of the 45+ countries where Real Time systems are in planning stages
- Countries where Real Time systems are currently live

- Recent announcement to implement Real Time payments include major economies:
 - United States
 - Eurozone
 - Australia
 - Hong Kong
 - etc.



Current Payment Methods Cannot Meet Business Needs that Require a RTP Solution

Ways to pay										
Payment method	Speed	Data	Automation		Cost					
Cash	Immediate	None	Does not work remotely		Does not work remotely		Does not work remotely			\$
Check	2-3 days	Remittance information (Lockbox)	Physical delivery and deposit		\$	\$\$				
ACH	1-2 days	Limited data	Managing cut-off times, bulk		Managing cut-off times, bulk			\$		
Wire	Immediate	Limited data	Difficult to initiate		Difficult to initiate		\$	\$\$		
Credit Card	Next day	Transaction and merchant data	Efficient		\$	\$\$				
Debit Card	Next day	Transaction and merchant data	Efficient			\$\$				
Same-Day ACH	Same or next day	Limited data	Managing cut-off times, bulk			\$\$				
Singe-Use Account	Next day	Transaction and merchant data	Requires manual receipt process		\$ Pay	\$\$\$ Receive				
Visa Direct	~30 minutes	Transaction and merchant data	Efficient			\$\$				
Real Time Payment	Immediate	Robust data and messaging	Efficient		;	SS				
Corporate Quick Pay	Same or next day	Robust transaction data	In-network	Out of network		\$\$				

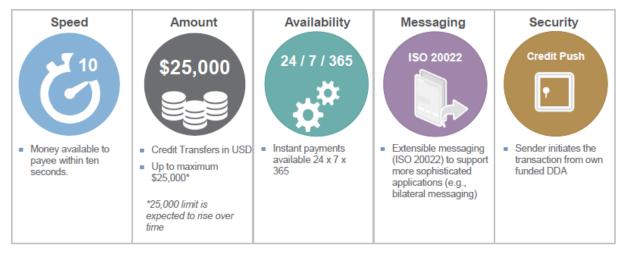
Challenge with today's payment methods

- Payments challenges: Immediate payments and mass payments are expensive and complex
- Data challenges: Insufficient data and messaging capabilities to link payments to broader business processes\
- These key issues result in:
 - Friction in supply chain management
 - Suppliers unable to ship goods due to lack of payment
 - Buyers must send cash or wire to receive last-minute goods or must miss sales
 - Buyers must closely manage inventory to request goods in advance
 - Reconciliation is challenging
 - Risk, reporting, and credit challenges due



Immediate, Irrevocable and Electronic

J.P. Morgan is a leader and board member of TCH's Real Time Payments initiative developing a set of industry level features and rules

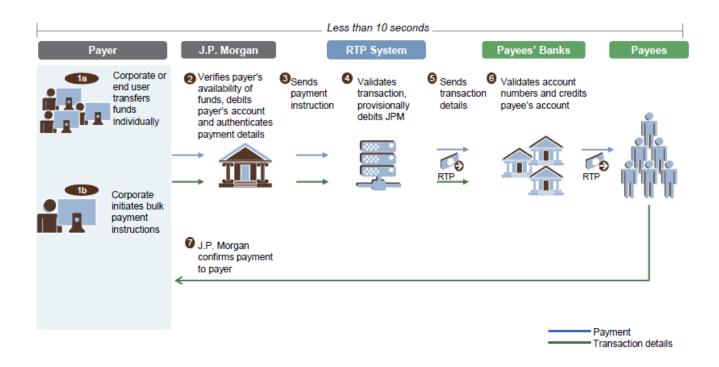


J.P. Morgan is working with other banks through The Clearing House (TCH) to implement a bank-led Real Time Payments infrastructure





Real Time Payments How Does Sending an RTP Work?





Simplifying Business by Connecting Buyer and Supplier Quicker







Simplifying business processes

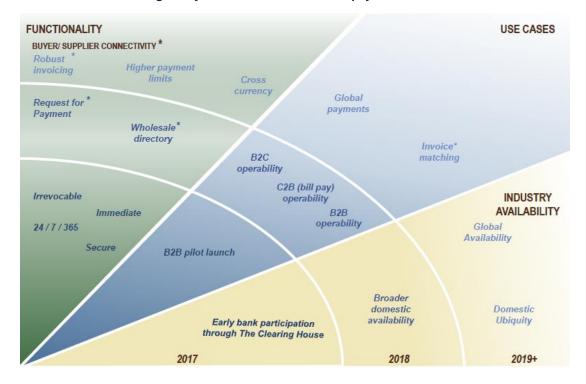
- Make just-in-time payments to suppliers
- Pay hourly/ temporary employee wages
- Make payments to resolve client complaints
 e.g. refunds & rebates
- Make irregular payments to many constituents
 e.g. legal settlements

- Instant payment confirmation
- Automatic reconciliation
- No batch cutoffs or underlying batch processes
- No settlement delay or underlying risk and credit requirements
- Allow our clients to better serve their clients



Real Time Payments Frictionless Payments and Information

J.P. Morgan's vision of Real Time Payments connects businesses and consumers globally with frictionless real time payments and information





Modern Spice Routes



Source - PayPal & Nielsen study: "Modern Spice Routes" looking at not domestic purchases across US, UK, DE, AU, CN, and BR

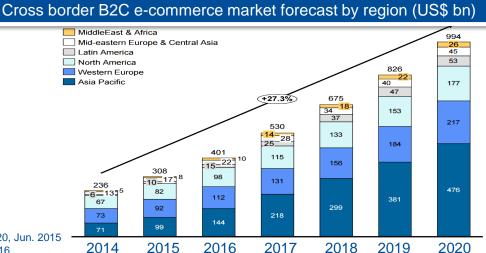
Global Cross Border Figures

• Global B2C cross-border e-commerce market will balloon in size to \$1 trillion in 2020 from \$230 billion in 2014*

More merchants are engaged in cross border e-commerce as

merchants are finding such trading profitable

 M-Commerce is considered the biggest reason behind cross border as merchants offer better multi-channel experiences**



^{*} Source: AliResearch – Accenture, Global Cross Border e-Commerce Market 2020, Jun. 2015





^{**} Source: PayVision Key Business Drivers in cross border ecommerce survey 2016

Implementing Global Payments





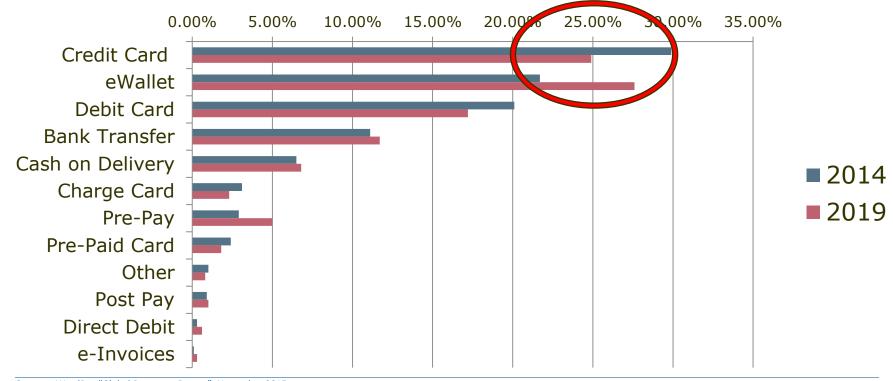
Global e-Commerce Payments

Payment Instrument	2015 Forecast	2020 Forecast	Examples
Bank Transfers	10%	13%	Includes real time bank transfers such as iDeal, Sofort, eNets, Przelewy24 as well offline bank transfers such as Safety Pay and Direct Debits such as SEPA DD, ELV
Cash on Delivery	7%	10%	Merchant and bespoke delivery company services (e.g. Kombini in Japan)
e-Invoices	0%	1%	Klarna, AfterPay
e-Wallets	31%	30%	Alipay, Tenpay, Paypal, Qiwi, Yandex
Post Pay	2%	1.0%	Konbini, Boletos
Pre Pay	3%	4%	Paysafecard, Neosurf, Amazon Gift Certifcates
Pre-Paid Cards	3%	6%	Visa and MC branded pre-paid cards
Debit Cards	17%	16%	Visa Check and MasterCard Debit
Credit Cards	25%	20%	Visa and MasterCard cards tied to line of credit
Other	2%	1%	Bitcoin, direct carrier billing

Source: WorldPay Global Payments Report 2016



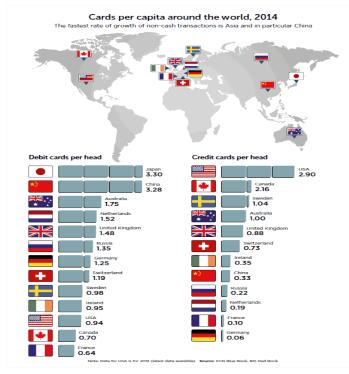
Shift To Alternative Payments





Cards Remain Popular Globally

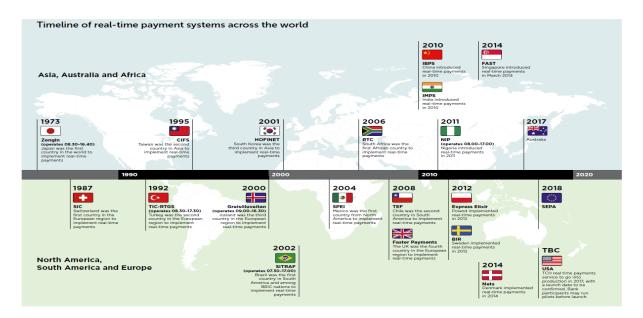
- Cards remain most popular method to buy online
- Penetration of cards does not equate with usage
 - Japan
 - China
 - Netherlands
- Cards are the dominant "pull" payment method





Move Towards Real Time Payments

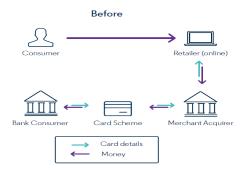
Could significant alter the payments flow

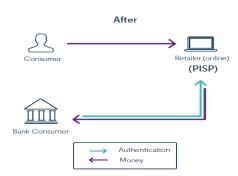




PSD2 Direct Access to Funds

- Direct access to bank accounts without intermediaries
 - Merchants become Payment Initiation Service Providers (PISPs)
 - Banks becomes an Account Servicing Payment Service Provider (ASPSP)
 - Service to be called Access to Accounts (XS2A)
- Banks to develop and expose Application Programmatic Interfaces (APIs)
 - APIs defined by the European Banking Authority (EBA)
 - No sharing of bank login credentials to AISP







PSD2 Creating New Services

- Allow creation of Account Information Service Providers (AISP)
 - AISP will consolidate information from multiple ASPSP (i.e. banks) in a manner similar to Mint in the US
 - Expected to create new products and services through a better understanding of consolidated data
- AISP will gain access to bank data using ASPSP' APIs
 - No sharing of bank login credentials to AISP





Going Global, Regional, Local

 There is no right or wrong strategy, just the right or wrong strategy for a company at any given time

	Global	Regional	Local
Addressable Market Penetration	-	±	+
Local Payment Instruments (PI)	-	±	+
Ease of Implementation	+	±	±
Local Legal Entity	+	±	±
Local Bank Account	+	±	-
PI Know-How	-	±	+
PI Cost Per Transaction	±	±	±
Tax Implications	+	±	-



Global Payments Implementation Strategies

- Develop the Target Operating Model for each Target Country
 - Ensure merchant has done all the "preliminaries"
 - Identify Payment Instruments to be supported
 - Identify payment flows and how they will integrate with company's operating procedures
 - Develop Cash Management and FX policies and procedures
- Select vendor(s) that can support payments acceptance in Target Country
 - Run a Request For Proposal
 - Ensure best pricing, best fit, best terms
- Monitor and ensure that the payment instrument AND vendor performance meet expectations





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