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Digital ASEAN Initiative

ASEAN e-Payments Coalition

e-Payments Recommendation Paper to the Working Committee on Payment & Settlement Systems (WC-PSS)

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Executive summary

The ASEAN region has a wide variance in readiness and regulation of e-payments. In the absence of a common ASEAN e-payment framework, some users encounter friction when making payments, especially when it comes to making and receiving payments across borders.

ASEAN public authorities recognize these challenges and have taken proactive steps to addressing them. The ASEAN Economic Community (AEC) Blueprint 2025 identifies financial stability, financial integration and financial inclusion as key elements towards achieving "a highly integrated and cohesive economy". The blueprint also identifies the establishment of regional payment infrastructure in ASEAN as a key objective.

In efforts to realize this goal, ASEAN central banks formed the Working Committee on Payment and Settlement Systems (WC-PSS) to research and provide policy recommendations to shape the future of payments in the region. This includes tackling tough issues facing the region, such as advancing real-time payment infrastructure, regional standardization, and interoperability.

Digital ASEAN[1] initiative was launched in April 2018 and is one of the World Economic Forum's flagship projects in South-East Asia. It aims to support the development of a vibrant regional digital economy. The initiative currently has four areas of focus: data policy, digital skills, e-payments and cybersecurity.

Members of the Digital ASEAN initiative also recognize these challenges and feel strongly that integrated and seamless e-payments are critical to accelerating growth of the digital economy across the region. To address these challenges and support the WC-PSS's work, they formed the ASEAN e-Payments Coalition. Its mission is to share industry insights and make recommendations that member states can implement to move towards achieving payment integration.

To guide their work, the ASEAN e-Payments Coalition took inspiration from the AEC and envisioned how the future of payments might look in the region. Their vision acknowledges the region's potential and outlines the following goals and principles to guide policy-makers:

- 100% of all ASEAN member state citizens have effective access to financial services that are appropriate, user-centred in design, and relevant to their evolving needs
- Any individual or business in ASEAN can pay or get paid by anyone instantly, both regionally and globally, through a range of cross-border payment methods best matched to a variety of use cases
- Payments are safe and secure and users have confidence in being able to easily and securely access their funds or line of credit from anywhere in the world
- Accessibility to a wide group of participants fosters innovation
- Interoperability ensures all instruments, products and services accepted for use under the requirements of a payment system or authorized financial institution are accessible worldwide
- Use of global standards and leveraging of existing infrastructure where possible enables ASEAN regional payments infrastructure to benefit from lower adoption costs
- Regional payments systems, infrastructure and applications are designed and operated with user needs in mind and achieve the highest levels of availability and resiliency
- There is a supportive environment to increase understanding and coordination between regulators

With this vision in mind, the coalition identified four key areas of focus for policy-makers. First, *Speed and Convenience* is critical in improving user experiences and encouraging e-payment system participation, especially as it relates to real-time payments. *Regional Standardization and Interoperability* is paramount in enabling cross-border transactions and, therefore, interregional commerce. Efforts to improve *Financial Literacy and Inclusion* ensures that future payment system innovation benefits all citizens of ASEAN, giving them greater access to financial services and empowering them to use services that match their needs. Finally, ensuring *Trust and Security* is essential safeguard consumers and maintain confidence in the system.

For each of these areas, the coalition identified the following policy recommendations in the hopes of creating a more efficient, integrated, inclusive, and secure payment system in the future:

Speed and convenience

1. Foster an open and competitive market
2. Ensure system accessibility and reliability
3. Encourage participation
4. Reduce friction and improve customer experience
5. Leverage existing payments infrastructure

Regional standardization and interoperability

6. Integrate standards and market practices
7. Recommend a framework for implementation
8. Explore digital trade policies to support regional and global integration
9. Expect parallel running of older and newer standards
10. Experiment with "proof of concept" trials
11. Manage liquidity and counterparty credit risk
12. Establish regional and national payment councils with public-private participation (e.g., a regular and permanent dialogue between the WC-PSS and the Coalition)

Financial literacy and inclusion

13. Invest in programmes to improve financial and digital literacy
14. Enable language localization
15. Promote government adoption of e-payments
16. Streamline and enhance customer identity frameworks
17. Coordinate financial literacy and inclusion action plans

Trust and security

18. Engage the payment service providers and their ecosystem
19. Recommend guidelines to encourage regional cooperation
20. Clarifying privacy and storage requirements
21. Improve awareness of cyber hygiene
22. Increase coordination between private sector, regulators and law enforcement agencies
23. Adopt global standards for anti-money laundering (AML)/countering financing of terrorism (CFT) requirements, adapted to ASEAN cross-border instant e-payments
24. Establish a regional consumer protection framework

Background

As the key enabling factor in digital commerce, e-payments are increasingly important to driving economic growth. As the global economy becomes more interconnected and digitized, a number of opportunities and challenges arise for cross-border e-payments as well. This also provides a tremendous opportunity for the public and private sectors to work together on solutions that can help reduce friction, expand financial literacy and access, and ensure that e-payments remain safe and secure.

ASEAN is acknowledged today to be one of the world's fastest growing and most dynamic regions, with its most distinctive characteristic being diversity. Within ASEAN, infrastructure, standards and regulations for payments vary considerably, needing a concerted effort for regional interoperability and to provide a fast and convenient cross-border payments experience to consumers.[2] Additionally, ASEAN member states are in varying stages of e-payment infrastructure development, so each country might have different cross-border payment regulatory requirements.

Another area of development in ASEAN is financial literacy. According to a financial literacy survey conducted by Standard & Poor's, less than 40% of the populations of Cambodia, Indonesia, Malaysia, the Philippines, Thailand and Viet Nam are financially literate.[3] Without adequate financial literacy, consumers, as well as small businesses, are unable to make optimal choices on financial services, often leading to higher costs and lower participation in the financial system among underserved populations. Additionally, low financial literacy leads to a lack of awareness of e-payment services and other digital financial services.

ASEAN's vibrant economy, favourable demographics, ICT investments and ongoing economic integration have laid the foundation for the region to become a global leader in the digital economy. At the same time, barriers exist for many consumers and small businesses to gain access to formal financial services. Rural communities often find it difficult to access financial services from both traditional banks and non-traditional financial players, largely because of a lack of commercial viability or basic connectivity and technology (e.g., smart phones) to enable new products (e.g., ride-sharing and e-commerce apps). Though a few ASEAN governments have taken steps towards establishing an integrated citizen identity management, it can be a challenge for unbanked populations in ASEAN to meet know-your-customer (KYC) requirements necessary for most financial services.

Emerging and innovative technologies are changing traditional models of operation in ASEAN. Pervasive mobile and internet penetration across the region is evolving the nature of e-payments. With technological advancement, the threat of fraud and cyber-attacks is ever-present, presenting broader challenges for the regional financial system in ASEAN.[4]

ASEAN has the potential to establish a robust regional information-sharing system across public-private sectors to facilitate cyber security threat and fraud prevention, detection and response.

AEC Blueprint 2025 Vision and Working Committee on Payment and Settlement Systems Goals

With many of these challenges in mind, the AEC Blueprint 2025 vision identified five interrelated and mutually reinforcing characteristics for future economic prosperity. These characteristics include:

1. A highly integrated and cohesive economy
2. A competitive, innovative, and dynamic ASEAN
3. Enhanced connectivity and sectoral cooperation
4. A resilient, inclusive, people-oriented and people-centred ASEAN
5. A global ASEAN

Under *A highly integrated and cohesive economy*, some of the key elements are *achieving financial stability*, *financial integration* and *financial inclusion*. This includes modernization of payment and settlement systems for cross-border trade, remittance, retail payments and capital markets. It will provide an enabling environment to promote regional linkages and payment systems that are safe, efficient and competitive. This will also require harmonization of standards and market practices based on international best practices to foster stability and efficiency within, as well as outside, the region.

The Working-Committee on Payment and Settlement Systems (WC-PSS), comprising representatives from ASEAN central banks, is tasked with conducting studies and providing policy recommendations for the development of the payment and settlement systems to meet AEC goals. This includes developing a policy framework for ASEAN real-time retail payments and achieving standardization and interoperability to enable innovative retail payments instruments. The policy framework will encompass:

1. Pricing guidelines
2. Operationalization of the interoperability of real-time retail payment system
3. Standardization of innovative retail payment instruments (interoperable QR code)
4. Collaboration and cooperative oversight and legal framework
5. Dispute resolution mechanisms

6. Consumer protection (includes mitigating and lowering payment fraud)

ASEAN e-Payments Coalition

To address the policy challenges facing e-payments and support the WC-PSS efforts, members of the Forum Digital ASEAN Initiative formed the ASEAN e-Payments Coalition. The coalition is a multistakeholder group, composed of more than 40 senior representatives from financial institutions, fintechs, payment networks, technology companies providing digital wallets, e-commerce platforms, universities, central banks and other government agencies, international and regional organizations, and other interested parties.

The coalition works in close alignment with the Forum's broader digital trade agenda, which will have an increased focus on e-payments as a tool to drive trade over the coming year. This work includes a 2018 Forum white paper, *Addressing E-Payment Challenges in Global E-Commerce*, which identifies challenges facing e-payment facilitation for e-commerce globally and includes guiding principles for policy-makers in addressing these challenges.[5]

The mission of the ASEAN e-Payments Coalition is to help develop a regional e-payment framework that is safe, secure, efficient, interoperable, inclusive, innovation-friendly, technology-neutral and serves both public and private interests. Since forming in April 2019, the coalition has met regularly to determine guidelines, outline a vision for the region, establish principles for e-payment policy and make specific policy recommendations for policy-makers, all of which are detailed in the remaining sections of this report. The intended audience for this report is the WC-PSS and the wider ASEAN community reviewing payments integration in the region.

Guidelines

To define the scope and direction of this project, the ASEAN E-Payments Coalition adopted the following guidelines:

1. Aligned to ASEAN objectives in the:
    a. AEC Vision 2025
    b. ASEAN Agreement on Electronic Commerce
    c. ASEAN Digital Integration Framework
2. Open market access and future ready, with recommendations that are model and technology agnostic
3. Competition and consumer/business choice will drive accessibility and affordability
4. Adoption of global standards to enable interoperability and reduce fragmentation
5. Adoption of best practices from industry that are:
    a. Innovative
    b. Forward-looking
    c. Prioritize user experience and security
    d. Drawn from previous thought leadership and research on ASEAN integration [6]
6. Payments-focused recommendations, with recognition that while compliance, security and data portability are also relevant, these are considered by other task forces under the Forum's Digital ASEAN Initiative.

Vision

In envisaging the future of the region, the Forum worked with payments industry leaders to create a vision for the e-Payments Coalition's work. In this vision, the coalition sought to outline key measures of success for any e-payment policy agenda. This vision does not prefer any single payment infrastructure but envisions a future in which:

– *100% of all ASEAN member state citizens have effective access to financial services that are appropriate, user-centred in design and relevant to their evolving needs*, as a result of technology allowing financial service providers to serve more people at a lower cost and with greater efficiency than ever before with viable digital payment solutions. Old and new digital payments service providers in ASEAN incorporate specific activities to improve financial and digital literacy as part of usual business and tailor products that are explicitly targeted at the underserved segments of the society. ASEAN member state governments will have financial inclusion programmes (for both individuals and micro, small and medium-sized enterprises, MSMEs), which will ensure that individuals/SMEs have effective access to finance and financial services that are cost-effective and interoperable throughout ASEAN. The corresponding increase in acceptance of digital payments leads to an acceleration in digital transformation.

– *Any individual or business in ASEAN can pay or get paid by anyone instantly both regionally and globally through a range of instant payment methods best matched to a variety of use cases.* Consumers are empowered in their understanding of various financial products and the ways in which these products can contribute to the enhancement of their financial lives, enabling them to be confident in their ability to transact and protect themselves online and, as a result, enable them to be open to embracing new technology, platforms and products. For businesses, benefits include reduction in late business-to-business (B2B) payments helping MSMEs in their cash flow management and supporting the development of regional e-commerce.

- *Payments are safe and secure, and users have confidence in being able to easily and securely access their funds or line of credit from anywhere in the world.* For example, enhanced security through tokenization means customers do not need to share sensitive account information when engaging in transactions. Additionally, relevant and accessible training is needed on key areas of technology and inherent areas of risk. Tools are available and clear accountability assigned to actively monitor and manage risk exposure to mitigate systemic threats to the payments system and to ensure ASEAN-wide e-payment cyber-security effectiveness, especially in the context of growing data localization regulatory requirements.

- *Accessibility to a wide group of participants (subject to standard prudential and market conduct requirements by regulators) fosters innovation* and more rapid adoption of new, easily accessible, ubiquitous and increasingly friction-less payments experiences for end users that meet the needs of, and provide choice to, users.

- *Interoperability ensures that all instruments, products and services accepted for use under the requirements of a payment system or authorized financial institution are accessible worldwide with minimal, if any, modifications*, providing a consistent end-user experience for consumers and businesses globally thus supporting e-commerce trade and development opportunities. ASEAN payment participants would also benefit from being able to have their cross-border payment instrument accepted in the interoperable global marketplace, especially merchants looking to expand to other markets within ASEAN.

- *Use of global standards and leveraging existing infrastructure where possible enables ASEAN regional payments infrastructure to benefit from lower adoption costs*. Adoption of global standards helps streamline intra-regional and global interoperability, creates a commonly understood market practice and eases adoption of best practices. The recommendation of maximizing reusability of existing infrastructure is equally applicable across both domestic and cross-border ecosystems. Businesses can be sensitive to the return on investment and slow to adopt new technologies given the cost of new implementations and frequent changes being required.

- *Regional payments systems, infrastructure and applications (and change control and incident management rules) are designed and operated with an eye to limiting adverse impact to users and achieving highest levels of availability*, including during maintenance and unforeseen circumstances. Key participants across the entire payment provider industry (including banks, fintechs, payment companies, telecommunication companies as well as their key infrastructure vendors like cloud service providers and cyber-security service providers) conduct regular business continuity exercises to examine industry and public sector resilience against operational disruption threats arising from cyber attacks.

- *There is a supportive enabling environment to increase understanding and coordination between regulators* (e.g. ICT/telecom and banking regulators) and international organizations (e.g. ITU and IMF) for cross-sector coordination for all mobile-facilitated payments, credit, insurance, lending, capital transfers including marketplaces where ownership is transferred and money is involved. There is an information-sharing mechanism (e.g. on potential threats and vulnerabilities) across public-private sector, across participating member states and their agencies, to facilitate cyber security threat and fraud prevention, detection and response.

Policy recommendations

Through its work, the ASEAN e-Payments Coalition identified four areas where the public and private sectors can work together to improve payments in the region: Speed and Convenience; Regional Standardization and Interoperability; Financial Literacy and Inclusion; and Trust and Security.

To guide its policy recommendations for each of these four areas, the coalition established the following principles, underpinning the optimal future scenario:

– **Provide open-market access so consumers and businesses can choose the most appropriate payments experience for their circumstances**

– **Prioritize user experience with an emphasis on increasing settlement speed while minimizing complexity and friction to drive user adoption**

– **Provide all citizens/permanent residents with an effective and interoperable form of digital identity/ unique identifier**, which financial institutions can use to perform anti-money laundering (AML), sanctions screening, countering financing of terrorism (CFT) and related KYC activity to ensure AML regulatory compliance and which can be linked to an account through which disbursement of government monies can be channelled

– **Optimize existing payments rails/assets where possible**, given the significant business costs of developing and participating in payment systems, or building new rails. This recommendation of maximizing reusability of existing infrastructure is equally applicable across both domestic and cross-border ecosystems

– **Adopt consistent global Trust and Security standards as part of the ASEAN e-payment roadmap** including regulations in KYC/AML/CFT, and ensure that public sector bodies collaborate with financial institutions and payments providers to learn optimal means to ensure the public are informed and protected against phishing and other cyber-terrorism attacks

– **Enhance domestic faster payments infrastructure in the initial phase, while maintaining regional momentum to strengthen capabilities for real-time cross-border payments in ASEAN**

Speed and convenience

Real-time payments are an increasingly important part of domestic and international payments systems around the world and will be present in all major Asian markets by 2020. Real-time payments open an important low-cost payment method for individuals and companies. A well-designed real-time payments system could offer benefits, such as a reduction in late B2B payments helping MSMEs in their cash flow management and reduced use of cash, which is a key objective of policy-makers.

To encourage growth speed and convenience in payments throughout the region, action is necessary from policy-makers. While seeking to promote an open and competitive market for e-payments, policy-makers can take concrete steps to ensure that future payment systems are competitive, accessible and reliable and provide users with a good payment experience.

Foster an open and competitive market

As ASEAN nations develop domestic real-time payments and explore a regional framework and to improve payment processing, it is important to ensure open-market access and competition within the payments ecosystem to achieve the best outcomes for consumers and businesses. Open and competitive payment systems drive innovation, making payments faster and safer for consumers and businesses. Notably, the private sector is already innovating more convenient and efficient payments using a variety of settlement options including automated clearing house (ACH), card rails, private sector real-time payment rails, and integration of cross-border with domestic real-time rails.

ASEAN member states can promote innovation and competition through a regulatory environment that encourages open-market access and a level playing field for new and established participants, rather than rely on mandates to encourage participation, support economic or other value incentives for participants in the payments value chain. For instance, easing implementation burdens for payment providers or improving accessibility for consumers will lead to long-term participation, whereas mandates can often lead to unintended consequences, including discouraging broader participation. Incentives will encourage participation and support long-term innovation (by providers) and adoption (by users).

Real-time payment systems

Real-time payment systems, also known as instant or faster payments, refer to payment systems that enable near real-time clearing and availability of funds and continuous service availability.[7] This differs from traditional payment systems, where clearing occurs after banks have completed settlement (e.g., once per day at the close of business). Over the past decade, many wholesale payment systems (i.e. high-value) have enabled faster availability of funds through real-time gross settlement (RTGS) systems, but increasingly real-time payment systems are also focused on retail payments (i.e. low value).

Because real-time payments are able to clear transactions more quickly than traditional systems, a key benefit for end-users is the ability to access funds in near real-time.[8] For MSMEs in particular, faster availability of funds could reduce difficulties related to cash flow and credit availability. The use of real-time payment systems is hence also extending to such business-related mid-value payments, in addition to low-value retail payments. Additionally, many real-time payment systems offer the opportunity for new e-payment service providers (i.e. non-financial institutions) to connect and add value to the broader payment ecosystem.

Real-time payment systems do require significant initial investments and can introduce new risks into the financial system, many of which this report addresses and works to mitigate. Concerns over new fraud and payee liability issues are on the rise due to the fast and irrevocable (i.e. cannot be cancelled) nature of real-time payments.[9] Additionally, in real-time payment systems with deferred settlement, financial risks between payment service providers need to be addressed.[10]

Ensure system accessibility and reliability

For ASEAN to further commercial and payments market integration, member states can take several steps to support accessibility and reliability by optimizing existing payments infrastructure and encouraging domestic real-time payment scheme development. Existing payments infrastructure (e.g. cross-border and domestic payment networks, clearing and settlement systems, card networks, mobile money, etc.) can be improved at a significantly lower cost than building new infrastructure through the adoption of global standards and encouragement of further regional integration (as explored in the next section, Regional Standardization and Interoperability).

In addition to leveraging existing infrastructure, efforts to move real-time clearing towards 24/7 settlement and development of real-time payment systems should continue. In countries where these systems do not currently exist, this effort should be financial market infrastructure priority in order to support domestic payment systems and eventually regional payment systems.

As real-time payment volumes increase, central banks could consider extending RTGS operations to cover weekends and bank holidays. Another model being reviewed in some markets is the option to reuse the real-time payments infrastructure as a back-up for the RTGS. This is usually in tandem with the option of increasing value thresholds for the real-time rails to incentivize migration of some of the RTGS traffic to the 24/7 available real-time rails.

As more countries move toward real-time payments, additional measures can be taken to ensure system accessibility and reliability. For instance, encouraging banks and operators to coordinate scheduled downtime would minimize disruption to users.

Encourage participation

For any new payment system to be effective, active participation from the broader commercial ecosystem is needed. There are several incentives member states could use to encourage greater participation in new payment flows. For instance, member states could encourage wider use of instant payments for low-value transactions to increase participation. Additionally, they could promote cost-effective clearing to increase adoption, including via clearing house incentives, such as lower fees or reduced fees on micro transactions.

There are also ways in which member states can reduce risk to encourage broader participation – to address settlement risk; deploy clearing house monitoring of transactions; trip wires; capital and collateral requirements; or a bank agent system for non-bank providers not able to meet capital or collateral requirements.

Raising transaction value limits or allowing exceptions could also encourage broader participation by attracting a broader base of transaction types. As an example of how exceptions may be allowed rather than hard caps on transaction size, caps could be considered on average transaction size for a rolling 30-day basis.

Further, member states should encourage industry-wide consistency in transaction limits and commit to raise them over time to promote greater adoption. Limit increases could also be segregated as per payment types; for example, retail transaction limits may be set lower for MSMEs.

Finally, to encourage participation among payment providers, member states should establish an access framework for overlay services like fintechs, payments providers, e-commerce firms to consume real-time payments services – either directly or via the other participants. Commonly defined APIs, for example, could be used for this purpose. These frameworks should be drafted to reduce friction as much as possible while ensuring these participants meet relevant security standards.

Reduce friction and improve customer experience

Reducing unnecessary friction in payment systems is critical to ensuring users are able to transact quickly and conveniently. Fortunately, new innovations in payment technology are reducing friction and providing customers with an overall greater experience. Member states should use these advancements to further regional goals.

For example, encouraging Request to Pay – a collective term for schemes that trigger payments – from bank accounts for individual transactions would allow the provider to seek payment rather than the customer needing to initiate a transfer. Unlike some legacy schemes, these types of payments can be made in real time and are suitable for single payments.[11]

Similarly, e-mandates for recurring transactions between firms and banks remove the need for customers to set up recurring transfers using paper-based systems.

Another way to reduce friction is through addressing, which replaces primary account numbers with self-selected account descriptions or proxies. This enables quick identification of payment participants and improves consumer experience by removing friction during payment initiation.

With all of these enhancements, the user experience can be further enhanced by enabling end-to-end transaction visibility to help with traceability, managing customer complaints and collateral management.

Leverage existing payments infrastructure

To increase the efficiency of payment systems, the relevant stakeholders must also consider past investments made across the entire payment ecosystem, both for cross-border and domestic payments. It is important to assess the real underlying problems or gaps that require new solutions to be applied to achieve a regional e-payment framework. An example of such an assessment would be to review existing cross-border and domestic (or next most efficient) payment rails and assess what more is needed to provide an end-to-end cross-border payment experience in the region. Such an approach may result in lowering the overall community cost of adoption by reusing the past investments.

Financial institutions of all sizes will need to shoulder the costs of connecting to a new set of rails. For smaller and medium-sized institutions, this cost could be significant, as real-time payments efforts in other markets have experienced. Any decision to build a new set of real-time rails should be done in a way that leverages existing infrastructure and expertise in faster payments rails, risk, fraud and end point solutions. Reusing existing technology and limiting future changes will be particularly important to business. Evidence has proven that businesses are very sensitive to the return on investment and are slow to adopt new technologies given the cost and frequent changes required. The recommendation of maximizing reusability of existing infrastructure is equally applicable across both domestic and cross-border ecosystems.

Regional standardization and interoperability

For interregional commerce to thrive in the future, policy-makers need to take steps to integrate the region's standards and increase interoperability between payment systems. The payments sector has developed standards to maximize global interoperability and encourage adoption and flexibility with new participants. Adopting global standards and best practices ensures that ASEAN member states are able to seamlessly connect with one another and the rest of the world.

Though not insurmountable, there are challenges to implementing standards – both for new standards and those currently used by participants – which are worth noting. Incorporating new standards and infrastructure into the payments ecosystem should be a goal for member states, but sufficient research, resources, oversight and time are necessary to ensure testing and implementation is successful. Participants vary significantly in their preparedness to implement new standards, ranging from nimble fintech companies to banks with legacy infrastructure that would require significant investments to update, to thousands of merchants with varying payment acceptance hardware. Given this, different timelines with phased implementation would be necessary and these timelines would likely span years.

Additionally, there are significant costs and risks that need to be addressing in operationalizing global standards. Investments, comprehensive research and testing are needed to improve security and fraud management while ensuring that innovation is encouraged. There are many long-term benefits to investments in these areas, but they may not always be apparent to businesses who see significant upfront costs that outweigh immediate benefits. Finally, it is important to recognize that while integration is the long-term goal, individual member states are at varying stages of e-payment development. Therefore, a one-size-fits-all standard is not a practical region-wide solution.

Integrate standards and market practices

To promote safety, innovation and competition in ASEAN, any regional payments framework should be based on existing global standards rather than the implementation of any proprietary regional framework. International standards form the backbone of the existing global payments industry. Standards typically address areas that are foundational to payments and necessary building blocks for payments to function globally, such as authentication of retail or corporate customers, security methods, business transactions, message models, dispute resolution and reference data like currency codes.

As regional cross-border payments systems develop, ASEAN governments and relevant agencies should ensure interoperability and ASEAN standards integration by supporting industry-led global standards, including the International Organization for Standardization (ISO) messaging standards; EMVCo security and acceptance standards, including for QR, Token, authentication (3D Secure 2.0); PCI SSC data-security standards; FIDO secure customer authentication standards; and W3C web payments and web authentication standards. For more information on individual standards, please refer to the Payments Standards Ecosystem table in the Appendix.

One example of where using international best practices is leading to interoperable standards in ASEAN is with QR codes. If all member states encourage standardization and use policy-maker influence to build a wide base of participant support, it could significantly streamline interregional payments with this important seamless payment technology.

Global standards enable ubiquity by maximizing global interoperability and acceptance, as well as creating a common approach at the physical and technical level. For example, ISO 20022 is a common global standard for financial messaging and provides an extensible repository of messages supporting all business processes in the financial industry. ISO 20022 provides an approach to unifying multiple existing financial standards (such as ISO 15022 and other ISO or proprietary standards for message formats).

International standards developed by bodies with cross-sector input facilitate security and innovation and contribute to trust in the payments system. For example, the adoption of EMVCo chip standards significantly reduced fraud and was also a precursor to the contactless chip which helped enable open-loop contactless transit payments. Corporate to bank initiatives on messaging and data standards also enabled more consistent sending of data among banks.

The requirements for standardization and interoperability need to be balanced by a guiding principle – similar rules for one payment provider type or area should not be applied across different payment service provider types without due deliberation. Global standards allow for enough flexibility in implementation to enable competition and differentiation across various payment systems. Global and open standards are not controlled by a single interest. Global standards are routinely updated for security and reflect the latest technology. It will be critical to ensure that the ASEAN payment market participants are required to use and keep up to date with the latest version of the global standards to enable innovation and continued interoperability with the rest of the global payments systems.

Further, to ensure that cross-border payments can leverage and connect into domestic real-time payments systems, local market practice on message standards, compliance requirements and other operational requirements need to be available to all participants. The more variance there is in local market requirements, the harder it will be for regional payment providers to integrate with domestic real-time payment systems. Conversely, the adoption of international standards, such as ISO 20022, enables seamless messaging, both domestically and regionally.

Explore digital trade policies to support regional and global integration

One way to reduce barriers for cross-border transactions is to establish regional trade agreements that ensure e-payment providers in individual member states can provide services throughout the region. In order to provide an incentive for more regional integration in payments, ASEAN could commit to ensuring market access to e-payment service suppliers for all member states. This would provide a long-term incentive for member states to move towards a regionally integrated payment and e-commerce markets.

A recent Forum white paper, *Addressing E-Payment Challenges in Global E-Commerce*, on this issue outlined how trade in services commitments could be applied to e-payments for trade commitments.[12] The World Trade Organization (WTO) General Agreement on Trade in Services (GATS) already provides a framework for how countries can guarantee market access for e-payment providers. WTO members can choose to make commitments to allow an e-payment provider to supply cross-border services (mode 1) and/or provide services abroad by establishing commercial presence in another member's territory (mode 3). Indeed, 53 WTO members have fully, or partially, liberalized "payment and money transmission services" in mode 1, and 99 have done so in mode 3, with some limitations.

Preferential trade agreements (PTAs) have also addressed e-payment issues in trade policy, which could serve as a framework for ASEAN. The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) advanced some financial services liberalization – financial institutions may supply services except where specific reservations have been filed by parties, while specific commitments have been made on e-payment card services, and with some requirements that include registration with relevant authorities, etc. The proposed United States-Mexico-Canada Agreement (USMCA) includes commitments on digital trade that enable the flow of data across borders that can help support e-payment supply. The USMCA also includes a "national treatment" requirement that e-payment providers from other member states be treated no less favourably than domestic providers.

E-payment suppliers, like many other modern businesses, need trade policy-makers to address regulatory friction to be impactful for cross-border scale. Trade negotiations can do so through "additional commitments" that complement increased market access. Additional commitments can address a variety of issues that do not necessarily constitute a formal market access barrier but can make it practically very difficult for a business to trade. For example, additional commitments could encourage regulators to allow for the introduction of new products or services in a timely and speedy manner, or commit to transparency of regulation on product approval, licensing criteria, and so on. Such approaches have not been explicitly pursued on e-payments to date in trade policy, though examples exist for financial services and telecommunications at the WTO and on other areas in PTAs. ASEAN economies could set a precedent for how to enable trade in the Fourth Industrial Revolution, creating a world-class business environment in the process.

Recommend a framework for implementation

After consultations with a comprehensive cross-section of payment system participants, the ASEAN WC-PSS, should publish a recommended framework to the ASEAN member states' participating government bodies for implementation. Currently, the assessment and preparedness levels of the individual ASEAN markets for adoption of global standards are varied, and each market should define a clear roadmap in partnership with the private sector for achieving this goal.

Expect parallel running of older and newer message format standards

As it relates to ISO 20022, parallel running and compatibility with ISO 15022 is essential during the time of transition. For card payments, which operate in an environment that is inclusive of consumers and merchants, standards should include ISO 20022 Acquirer-To-Issuer Cards Messages, or ATICA (once commercially available), and the existing ISO 8583 messaging standards. Migration of card payments from ISO 8583 to ISO 20022 will need to be commercially and strategically driven by the ecosystem at a global level. Parallel running of ISO 8583 and ISO 20022 will be required for a significant time.

Experiment with "proof of concept" trials

After consultation with payment participants, the ASEAN WC-PSS should proceed to a "proof of concept" or trial of new connectivity models being considered for regional real-time payments infrastructure, starting with bilateral arrangements. This will allow for a deeper understanding of the underlying challenges and opportunities presented by different options and progress towards future implementation.

ASEAN regulators should consider approaches that minimize impact to the wider financial community, such as by utilizing existing payments assets, and adopting global industry standards for cross-border and domestic instant payments in ASEAN.

Manage liquidity and counterparty credit risk

Consistency in managing liquidity and counterparty credit risks is also key to the development of the ASEAN regional payments system. There are differences in settlement timing and collateral requirements between participating ASEAN markets and payment instruments, which can result in credit risks and cost implications for participants in cross-border e-payment schemes. For example, if payments were mostly "one-way" between two ASEAN member states that have different settlement timing and collateral requirements, this scenario could create liquidity challenges, heighten credit counterparty risk and increase systemic risk for the bank that is constantly paying out. As such, central banks in ASEAN should actively monitor and be committed to establishing a mechanism for transparent intervention in the event of emerging imbalances.

Establish regional and national payment councils with public-private participation

In order to maximize the positive impact of the private sector, it is important to treat it as a partner in all aspects of the effort. The experience and capabilities of private sector players with cross-border expertise will make the difference when it comes to end-user knowledge and capabilities. It is one thing to build and operate a real-time payment system between financial institutions and central banks/national bank associations. However, it is a very different level of expertise and engagement when it comes to developing schemes and rules – focusing on the competitive customer experience and putting consumer incentives and a true value proposition in place that will make customers want to adopt a new payment system.

Many of the industry players involved in the Forum's Digital ASEAN Initiative have extensive experience and successful track records in the support of global industry standards, and proactively engaging in various standards organizations discussions to support industry-wide consistency in the implementation of payments. For example, ISO has fully established processes for maintenance, evolution and governance that involve the private sector players. The change management calendar and governance process are global and available to the relevant private sector stakeholders for raising change requirements.

In order to formalize this public-private partnership, we recommend that ASEAN member states establish both national and ASEAN regional payment councils to bring together ecosystem players to develop solutions to common challenges. In some countries, governments have established payment councils comprising industry stakeholders to assist in the development of a national payment strategy or to provide guidance on other payments-related issues. As an example, the Monetary Authority of Singapore (MAS) established the Singapore Payments Council – which comprises 20 leaders from banks, payment service providers, businesses and trade associations, bringing together both the providers and users of payment services in Singapore. It encourages collaboration within the payments industry, promotes interoperability among e-payments solutions, develops strategies to drive the pervasive adoption of e-payments, and makes recommendations to MAS on payments-related policies.[13]

A phased approach towards the establishment of an ASEAN-wide payment council could begin with a payments industry association or coalition representative with cross-border experience on the WC-PSS. As this report illustrates, payment issues are wide in scope and complexity, and this representative could function as a bridge between WC-PSS and other industry players to address a wide range of issues and provide valuable insight in emerging payment technologies and their potential benefits.

Without significant private sector involvement that works for key stakeholders, it will be difficult to successfully implement a new payments platform that is widely adopted. If the goal is to gain near-term user adoption, it is even more critical to secure private sector partnership. Such partnership is also required to maximize reuse of available public and private infrastructure for enabling real-time cross-border payments, and co-creation of services that address real, underlying problems for end consumers.

Establishment of a regular and permanent dialogue between the Coalition and the WC-PSS is also recommended towards supporting these common goals.

Financial literacy and inclusion

The public sector can lead the way in ensuring that consumers and merchants have unimpeded access to the knowledge and information that can empower them to take advantage of digital financial services including e-payments. ASEAN, as an organization as well as its constituent governments, has devised many different measures and approaches to improving financial inclusion and access in the region. Continued and concerted efforts, especially in partnership with the private sector, can help the region realize the potential of digitalization.

Invest in programmes to improve financial and digital literacy

Improving both financial and digital literacy in the region would be the first step towards ensuring a robust adoption of digital payment services. The first step towards doing so would be the integration of technology-focused financial education in schools, starting at the elementary school level. Experiential learning has been shown to be particularly effective in helping young learners develop competence in financial matters[14]. For secondary- and tertiary-level students, awareness of digital payments can be enhanced by incorporating courses on e-payments and digital finance in their curriculum.

By working with the private sector, governments can also ensure that adults have access to information on financial management, digital financial products and the opportunities offered by the digital economy. Making this information available through offline avenues such as local government offices and community centres will ensure that those who are seeking to learn how to take their first steps online will also have access to this information. Providing curriculum that can address the needs of many different levels of financial and digital expertise is crucial.

Additionally, in conjunction with private sector players, governments can provide hands-on training to students in tertiary and vocational institutions to equip these students with the necessary know-how to assist MSMEs in digitizing their businesses. This would both enable these students to gain marketable skills and resolve the lack of access faced by the MSMEs to expertise on digitalization.

For instance, a global payment service provider established a fintech programme for institutes of vocational learning in Singapore. Through a curriculum specially designed for students at these institutes, the programme grooms fintech talent to be future-ready and equips polytechnic students with the foundation of e-payments and technical integration of commonly used PayPal products. The students will then be able to use this knowledge to integrate PayPal solutions into their school or industry projects. They can also work with MSMEs to integrate these solutions into their websites, thereby earning supplementary income while also enabling MSME digitalization in Singapore and beyond.

At the same time, it is important to ensure that marginalized groups such as women, the elderly and rural populations are provided with relevant and accessible training to enhance their knowledge and education in the key areas of technology. To do so, geographic, cultural and economic barriers to access have to be taken into account.

Singapore, for example, has taken several efforts to empower and encourage seniors to embrace technology. Through roadshows, continuing education centres and workshops for the elderly, Singapore's Infocomm Media Development Authority (IMDA) introduces the elderly to useful lifestyle, communications, entertainment and transport apps, including social media and ride-sharing apps. By conducting mass tutorials in residential hubs in English and Mandarin, the IMDA has been able to educate thousands of seniors on various services available online. Similar targeted approaches that are cognizant of prevalent information gaps can yield results.

Also under the Digital ASEAN Initiative, the World Economic Forum's ASEAN Digital Skills Task Force has built the ASEAN Digital Skills Vision 2020[15] programme, which aims to build a collective pledge on training digital skills for not only workers, but also consumers and users of digital services (such as SME traders), as well as digital regulators in the ASEAN region. To date, 17 leading organizations, including the world's biggest technology companies, have stepped up, pledging to train millions of youth in ASEAN to unlock the region's digital potential in the Fourth Industrial Revolution.

Enable language localization

Providing resources that can enable language localization – including comprehensive data about user language preferences in accessing financial services would greatly help businesses evaluate the benefits of providing local languages for these services. For instance, if a payment service provider has access to the share of a country's population that opts to access ATM services in their local languages, they would be able to gauge the benefits of rolling out an app or website in the local languages and invest in these resources accordingly.

Efforts to improve financial and digital literacy should also take language barriers into account. The curriculum as well as the medium of training should be in the languages that students are comfortable with and/or fluent in.

Promote e-government initiatives

According to the World Bank's 2017 Findex Report, digitizing regular payments (such as wages, bills, or government payments) is one of the best ways to encourage unbanked customers to sign up for an account.[16] ASEAN governments can lead the way by giving their citizens the option to make utility bill, tax or other government payments online and, where possible, provide clear incentives for them to make the shift to digital payments. For instance, Singaporeans who submit their passport renewal applications online are entitled to a discount and pay S$70 instead of the usual S$80.

At the same time, providing government beneficiaries with the option to receive their government payments electronically would encourage beneficiaries to create digital payment accounts. However, it is important to ensure that adequate infrastructure and awareness is in place for citizens to make full use of these digital options.

Streamline and enhance identity frameworks

In order to bring more participants into the financial system who currently do not meet current KYC requirements, a two-pronged approach is needed. First, a modernizing of national identity record systems by ASEAN member states would make it simpler for consumers to fulfil KYC requirements and gain access to financial services. Because various parts of government regulate identification records, personal information gathering, and KYC and anti-money laundering (AML) requirements for financial transaction, this effort requires coordination across ministries, particularly ministries responsible for social services, financial regulation, and information and communication technologies.

Second, in addition to ensuring that more consumers are able to meet KYC requirements through enhanced national identity systems, KYC requirements themselves could be streamlined to lower barriers to consumer access. Many countries have sought to remove unnecessary barriers for consumers to meet KYC requirements through new technologies. Of course, KYC and AML standards must be maintained to prevent financial crime, and transactions with higher risk should be subject to enhanced requirements (as noted in the next section, adopting global standards here could reduce interregional payment friction and improve financial inclusion). Therefore, member states should work together to develop best practices and implement an agreed on tiered KYC scheme, which takes a risk-based account opening approach that lowers barriers for low-value accounts. ASEAN regulators can engage with regional and global bodies for strengthening digital identity frameworks to support the design and development of a trustworthy e-payments ecosystem.

While all of these efforts to streamline customer identification will empower many consumers who do not currently have access to the financial system, the future of e-commerce and digital trade will rely extensively on digital identification as well. To facilitate this in the future, member states could develop legal frameworks for digital identity verification to allow for faster customer due diligence both domestically and across borders.

Coordinate financial literacy and inclusion action plans

To ensure coordinated approaches to financial inclusion across ASEAN, each member state should submit and regularly update national plans for improving financial inclusion within their respective countries. These plans can be used to establish regional best practices and increase coordination, which is especially important for AML/KYC requirements and authentication standards.

Research on that state of financial inclusion within each member state will be an important part of these national plans. Statistical information for unbanked and underbanked populations will enable member states to target financial literacy and inclusion programmes, as well as track progress over time. Regional coordination should also be a guiding principle for these research plans, with regionally agreed on definitions for what constitutes unbanked and underbanked.

Trust and security

We have seen the importance of ensuring that e-payments are convenient, interoperable and accessible by all members of society. All of this is lost, however, if individuals and businesses do not trust in e-payment systems and nothing erodes trust more than breaches in security leading to fraud and cyber crime. Fortunately, there are many ways the public and private sectors can work together to improve awareness and collaboration on security issues, as well as establish guiding frameworks for broader consumer protection.

Recommend guidelines to encourage regional cooperation

Because there is significant variation among the laws and regulations of ASEAN states, regional frameworks should focus on best practices and be voluntary in nature. For all policy challenges related to trust and security, it is important that public authorities work closely with the private sector to develop these frameworks. Where possible, the public and private sector should work together to identify best practices that can be used to improve trust and security in the system, and the public sector can use them as examples in supervisory examinations.

The US National Institute of Standards and Technology (NIST) Cyber Security Framework, for example, is a voluntary set of guidelines for managing cyber threats that has been emulated by other governments (such as the UK) and international associations alike.[17] It includes risk-based industry standards and best practices for both government and private sector use, consisting of five major focuses: identify, protect, detect, respond and recover. NIST emphasizes that the framework is not one-size-fits-all; rather, organizations can use it as foundational guidance to tailor according to their unique threats and vulnerabilities.

Clarifying privacy and storage requirements

As regulations on financial services and digital technologies become increasingly complex, it is important for regulators to clarify requirements on a number of issues to facilitate compliance among payment providers.

First, having a consistent definition for anonymized information across ASEAN would help facilitate compliance for many payment providers operating throughout the region and ensure consumer information is adequately protected. Similarly, having an agreed on set of requirements for sharing this information with non-financial institutions (i.e. fintechs) would also accelerate regional integration and level the playing field for fintechs across the region.

Additionally, recognize that cross-border data flows are essential to the effective functioning of the domestic and international financial system – including for anti-money laundering or Know-Your-Customer (KYC) checks, to enhance cyber security, enable business continuity, and for fraud detection and threat intelligence with the use of artificial intelligence and machine learning. Therefore, it is important for member states to have consistent and clear guidelines that enable cross-border data flows.

Improve awareness of cyber hygiene

Users who are taking their first steps towards digitizing their finances should also be educated on ways to protect themselves online. ASEAN can consider establishing an easily accessible region-wide repository of cyber scams and threats which would serve as an important step towards both information sharing between various stakeholders in the region as well as a database for users on information about prevalent threats and means to counter them. Government-led campaigns to promote good cyber-security practices have also proven to be effective. In Singapore, for instance, there are eye-catching public service advisories on public transport vehicles and stations that provide public information about common cyber attacks, ways to prevent them and contact details of law enforcement agencies in the event of an attack. At the same time, it is important to ensure that victims of cyber attacks do not feel shamed; this is counterproductive and would prevent timely information on threats being shared.

Furthermore, ASEAN governments can implement and encourage the use of internationally recognized email and domain authentication standards to protect users from attacks through fraudulent email. Over 90% of all cyber attacks globally start with a phishing email[18] and phishing has been recognized as the most likely first step in attacks by cyber terrorists.[19] Anti-phishing measures that can be promoted by governments include authentication standards that validate the domain contained in an email “From” header is authentic by crosschecking against domain name system (DNS) records. Email servers can then accept, reject, or warn against incoming emails based on this information.

Financial institutions and payments providers are often used as bait in phishing attacks and have developed expertise in countering them. By working closely with the private sector, ASEAN governments can ensure that their constituents are better informed and protected against such attacks.

Increase coordination between private sector, regulators and law enforcement agencies

Coordination and data sharing among ASEAN law enforcement agencies and the private sector is critical to improving trust and security. Additionally, greater collaboration is needed between ASEAN programmes, especially public and private sector collaboration, including law enforcement agencies, and mediated through a neutral party.

Important areas of regional review include cyber security, anti-money laundering, data sharing and other relevant law enforcement topics. A task force comprising law enforcement agencies focused on financial cyber crimes, as well as private sector participants from a wide range of payment service providers would be a useful forum to increase regional coordination in these areas.

For example, a private-public sector financial industry cyber-security incident response team (CSIRT) could be formed to support cross-border, financial-related situations. This could be an extension of the Singapore-ASEAN Cybersecurity Centre of Excellence, for cross-border financial sector collaboration in cyber security.

Adopt global standards for AML/CFT requirements, adapted to ASEAN cross-border instant e-payments

Throughout ASEAN, there are varying requirements to prevent money laundering and terrorism financing. These regulations are critical to protecting the safety and security of citizens and the financial system, but they can sometimes act as barriers to regional integration and financial inclusion when there is not broad alignment or shared definitions.

As it relates to regulatory compliance and reporting consistency, across ASEAN there are differences in required minimum value levels for reporting, which can create friction in the broader payment value chain. A framework to ensure consistency in such regulatory document requirements can prompt necessary regulatory compliance to mitigate regulatory compliance risks.

One model to further align AML/CFT requirements across member states and beyond could be to adopt globally recognized standards, such as those recommended by the Financial Action Task Force (FATF). The FATF is an inter-governmental body with the mission to identify and promote effective measures for combating money laundering, terrorist financing and other threats to the integrity of the financial system.[20] In 2012, it outlined technical recommendations for how countries can best identify risk, apply preventive measures, enhance transparency and facilitate international cooperation, all of which are important to address within the ASEAN region.[21]

Establish a regional consumer protection framework

For consumers to have trust in the financial system, they need to know they are protected when making e-payments. Therefore, we recommend member states work with the private sector to develop a customer protection framework. The scope should be aligned with regional priorities, but some areas to address could include consumer fraud liability, data privacy and complaint reconciliation.

Conclusion

The recommendations outlined within this report reflect the hard work of the Forum ASEAN e-Payments ASEAN Coalition and the importance of public-private sector collaboration on policy issues. Members of the e-Payments Coalition believe that these recommendations will improve user payment experiences, promote regional integration, increase trust and security and improve the livelihoods of the underbanked.

While the WC-PSS upcoming policy framework will be an important milestone for e-payments in ASEAN, we believe it is just the beginning of public-private collaboration to address future e-payment issues and ensure the region remains a hub for innovation. Therefore, the coalition will continue to support ASEAN's efforts in addressing future payment policy challenges and finding new avenues for public and private sectors to collaborate.

The Forum ASEAN e-Payments Coalition looks forward to the establishment of a more regular and possibly permanent rhythm in the dialogue between the coalition, WC-PSS and other key stakeholders in the region.

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Appendix

Payment Standards Ecosystem

Rails	Card	RTGS/ ACH	RTP	Adoption deadlines	Links to purposes and benefits of standards
Standards					
Message format	– ISO 8583 – ISO 20022 (ATICA – for card transactions) – ISO 20022 (CAPE) – ISO 18245 (Merchant Category Codes)	MT MX ISO 15022 ISO 20022	ISO 20022 ISO 8583	ISO20022 – 2021 ISO20022 ATICA – 2020	https://www.iso.org/benefits-of-standards.html
Data security	– PCI Data Security Standard (PCI-DSS), PIN on off the shelf devices (PIN on COTS), Point to point (P2PE) encryption – EMVCo chip security and EMVCo Tokenization – GlobalPlatform device level security – SWIFT Customer Security Controls Framework				https://www.emvco.com/ https://globalplatform.org/ https://www.pcisecuritystandards.org/ https://www.swift.com
Instrument/ form factor	– EMVCo contact; contactless, QR; mobile, Secure Remote Commerce (SRC) – ISO chip contact/ contactless, ATM cards – GlobalPlatform device level security				https://www.emvco.com/ https://globalplatform.org/
Authentication	– EMVCo 3DS 2.0, Secure Remote Commerce (SRC), Consumer Device Cardholder Verification Methods (CDCVM) Fast Identity Online (FIDO) Alliance – Universal Authentication Framework (UAF), Universal 2nd Factor and FIDO2 – World Wide Web Consortium (W3C) Web Authentication			3DS 2.0 MasterCard - October 2019 Visa – April 2020	https://www.emvco.com/ https://fidoalliance.org http://www.w3.org/

Glossary

Descriptions and definitions of terms in retail payment services and instruments taken from https://www.bis.org/cpmi/publ/d168.pdf

Account information service providers are entities offering a service to provide consolidated online information on one (or more) payment account(s) held by end users with one (or more) other entity(ies) offering payment services.

ATMs (automated teller machines) are terminals that allow authorized users, typically by using a card, to access a range of services such as cash withdrawals, balance enquiries, transfers of funds and/or acceptance of deposits. Note that not all ATMs need to have cash withdrawal functionality.

ATM acquirers are entities that are in a contractual relationship with the owner of the ATM and transfer payment-related data from the ATM where the cash withdrawal occurs to the issuer of the payment instrument, including data related to the authorization of the cash withdrawal.

Technical service providers, such as the ones offering mere processing and storage of data or operating ATMs, are not considered ATM acquirers. Banks are financial institutions whose business is to receive deposits, or close substitutes for deposits, and to grant credits or to invest in securities on their own account. For the purpose of this data collection, banks are institutions that are licensed as banks according to the jurisdiction's legal framework. Money market funds, investment funds and pension funds are excluded from this category.

Cards are payment instruments based on a unique number that can be used to initiate a payment, cash withdrawal or cash deposit that is processed using/over a card scheme or – for withdrawals and deposits at the ATM – within the network operated by the issuer of the card. The number can be stored on a plastic card (one of the traditional meanings of the word "card"), on another physical device (e.g. key tag, sticker, smartphone) or can be held virtually without a physical device.

Card schemes are a single set of rules, practices, standards and/or implementation guidelines for the execution of card payments.

Cheques are payment instruments based on written orders from one party (the drawer) to another (the drawee, normally a bank) requiring the drawee to pay a specified sum on demand to the drawer or to a third party specified by the drawer. Cheques may be used for settling debts and withdrawing money from banks. Cheques include travellers' cheques and bankers' drafts.

Chips are microprocessors embedded on a physical device, which are loaded with the information necessary to transmit payment information. Contactless technology allows for the transmission of payment information from a physical device to the terminals at the point of sale or ATM without the need for physical contact between the physical device and the terminal. Information used for contactless payments can be stored on a chip, plastic card or other physical device (e.g. smartphone, key tag, sticker, watch). For the purpose of this data collection, the concept of contactless extends beyond that of near-field communication and also includes other forms of technology applied to perform contactless payments, e.g. Bluetooth low-energy and QR codes.

Credit transfers are payment instruments based on payment orders or possibly sequences of payment orders to place funds at the disposal of the payee. Both the payment orders and the funds move from the payer's institution to the payee's institution, possibly via several other institutions as intermediaries and/or one or more payment systems.

Device-present payments are payments in which a physical device, loaded with the information necessary to perform payments, is physically present near the physical terminal at the time the payment is initiated. Contactless payments at POS (see below) terminals are considered device-present payments.

Device-not-present payments (also called remote payments) are payments wherein the device, loaded with the information necessary to perform payments, is not physically present near the physical terminal at the time the payment is initiated (e.g. payments initiated via internet, mail order, mail, phone or fax, or card payments initiated by entering the card number on an EFTPOS, see below, terminal). This includes cases where the end user is present at the merchant's location but the device is not physically present near the physical terminal at the time the payment is initiated (e.g. when a restaurant bill is charged to the credit card used for the reservation and no device is physically provided at the moment of payment).

Direct debits are payment instruments based on preauthorized debits, possibly recurrent, of the payer's account by the payee.

Electronic funds transfer at the point of sale (EFTPOS) terminals are point of sale terminals that can capture payment information electronically. This includes unattended terminals such as vending machines.

E-money is prepaid value stored electronically, which represents a liability of the e-money issuer (a bank, an e-money institution or any other entity authorized or allowed to issue e-money in the local jurisdiction) and which is denominated in a currency backed by an authority. The aggregate does not include value of digital currencies as per the 2015 CPMI report on digital currencies. For the purpose of this data collection, prepaid value stored electronically that is accepted only by the issuer (single purpose) or by the issuer and a limited number of organizations/merchants, at a limited range of locations or for a limited number of purposes (limited uses), is not included under e-money.

E-money institutions are legal entities other than banks that issue e-money, where applicable authorized based on the relevant legislation.

E-money issuers include banks that issue e-money, e-money institutions and – if applicable – central banks and government issuing e-money.

E-money loadings are transactions wherein funds are stored as e-money value (either from cash or from a payment account).

E-money payments are payments where the holder of e-money transfers e-money value from his/her balance to the balance of the payee.

E-money unloadings are transactions in which funds are withdrawn from an e-money storage (either into cash or to a payment account).

End users are users of payment services as opposed to institutions offering payment services; for example, consumers, corporates and merchants. The institutions providing payment services are also end users whenever they use payment services offered by others for their own retail payments (e.g. utility bills and salaries).

Fast payments are payments in which the transmission of the payment message and the availability of "final" funds to the payee occur in real-time or near real-time and on as near to a 24-hour and seven-day (24/7) basis as possible. Specific examples are available in Annex 2 of the 2016 CPMI report, *Fast payments – Enhancing the speed and availability of retail payments*.

Government includes the central government, state government, local government and social security funds. It also includes non-profit institutions engaged in non-market production that are controlled and mainly financed by government units and social security funds. Central banks, other official monetary authorities and public corporations are not part of the government.

Issuers of payment instruments are entities that (1) make payment instruments directly available to end users; (2) authorize payments (at physical or online points of sale, or at ATMs); and (3) in the case of card payments, guarantee payments to the acquirers.

Magstripes are magnetic stripes on the back of a plastic card, which are loaded with information relevant to perform a payment.

Merchant acquirers are entities responsible for (1) collecting from the payee (i.e. the merchant) all the information necessary to process the payment; and (2) the subsequent transfer of the payment amount to the payee.

Money remittances are payment services where funds are received from a payer, without any payment accounts being created in the name of the payer or the payee, for the sole purpose of transferring a corresponding amount to a payee or to another institution offering payment services that is acting on behalf of the payee, and/or where such funds are received on behalf of and made available to the payee.

Non-banks offering payment services/instruments are entities not licensed as banks according to their jurisdiction's legal framework which offer payment services. This may include the government if it offers payment services. This concept applies only for the purpose of this data collection and differs from the definition included in the 2014 CPMI report, *Non-banks in retail payments*.

Non-electronic funds transfer at the point of sale (non-EFTPOS) terminals are point of sale terminals that capture payment information by paper voucher (e.g. paper voucher imprinters).

On-us payments are payments in which the payer's and payee's accounts are held by the same institution. In the case of card payments, this means that the issuer of payment cards and the acquirer are the same institution.

Payment accounts are accounts where deposits or stored values which are convertible into currency and/or transferable on demand without significant delay, restriction or penalty are held in the name of one or more end users. The value can be used for payments (i.e. can be debited directly using one of the payment services/instruments mentioned in Tables 5 and 6). This excludes savings accounts; it may include time deposits. It also excludes credit card accounts that cannot be debited using one of the payment services/instruments mentioned in Tables 5 and 6.

Payment initiation service providers are entities offering a service to initiate a payment at the request of the end user, accessing value stored on payment accounts held at another institution offering payment services.

Payment instruments are credit transfers, direct debits, card payments, e-money payments and cheques.

Payment services refer to any service that is required for payments or facilitates them.

Point of sale (POS) terminals are devices typically used at a retail location to capture payment information electronically and – in some cases – on paper vouchers.

Real-time payments, also known as instant or faster payments, refer to payment systems that enable near real-time clearing and availability of funds and continuous service availability.

Retail payments are payments where at least one of the parties is an end user. This includes payments by institutions offering payment services when they use payment services offered by others to pay their own utility bills, salaries, etc. Stored value consists of either value stored in a payment account or e-money value. The aggregate does not include outstanding values of digital currencies as per the 2015 CPMI report on digital currencies.

Storage of value offers the possibility to store value in payment accounts or on devices.

Tokenization is the process of replacing sensitive data (e.g. account or card number) with unique identifiers (i.e. tokens) that either replace or mask attributes associated with the original data.

Endnotes

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22 Coalition organizations include Asian Development Bank, AirAsia Bhd, American Express, Ant Financial Services Group, Asia Cloud Computing Association, Asia Foundation, Axiata Digital, Bain & Company, Baker McKenzie, Citigroup, Creation Group of Companies Ltd, Deutsche Bank, Facebook, Go-Jek, GrabPay, GSMA, HSBC Holdings Plc, Lippo Group, MasterCard, McKinsey & Company, MUFG Bank Ltd, Oliver Wyman, PayPal, People Centered Internet, SAP, Sea, Standard Chartered Bank, SWIFT, The Asia Foundation, Tokopedia, TRPC, University of Indonesia, Vina Capital, Visa, and Xfers.

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