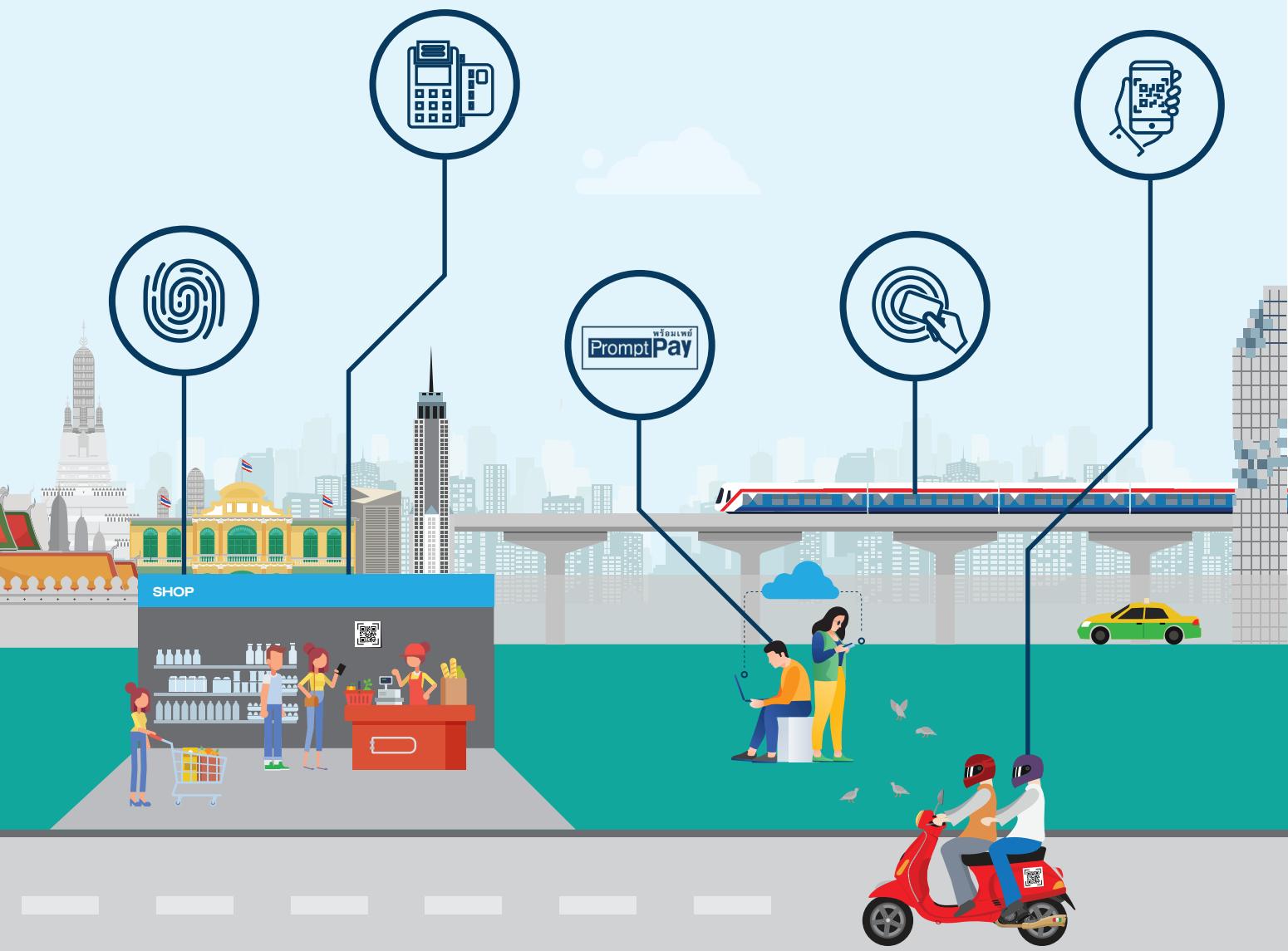




BANK OF THAILAND

Payment Systems Roadmap

No.4 (2019-2021)





BANK OF THAILAND

Payment Systems Roadmap

No.4 (2019-2021)

VISION

Digital Payment is to be the most preferred choice
in efficient, safe, low-cost payment systems
that meets users' needs

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Future Payment Systems
in Thailand

Importance of the Payment Systems Roadmap



Importance of the Payment Systems Roadmap

The Bank of Thailand (BOT), as the payment policy-making authority, has been consistently advancing Thailand's payment systems to be efficient, secure, and safe through its Payment Systems Roadmaps. The BOT has already formulated three Payment Systems Roadmaps, each of which includes important implementations, as follows:

No. 1 (2002 – 2004) Laying the foundation by developing infrastructure and important payment systems standards: such as incorporating National ITMX Co., Ltd. to develop and maintain payment infrastructure for private entities and to support cross-bank fund transfers; designating the central standards for barcode payments to facilitate bill payments and reduce costs for the business sector; and developing the ASEANPay project to support connectivity through ATM funds transfer among ASEAN countries (Asian Payment Network : APN).

No. 2 (2005 – 2010) Pushing payment services to be efficient and safe under efficient regulations and law enforcement: such as advocating for the issuance of the Royal Decree Regulating Electronic Payment Service Business, B.E. 2551, as a means to regulate payment systems providers for the creation of safe and trustworthy systems, and developing the Imaged Cheque Clearing and Archive System (ICAS) to reduce the costs of cheque administration.

No. 3 (2012–2016) Promoting and enhancing the efficiency of payment systems in order to support economic activities in every sector: such as improving the security of electronic card usage by requiring banks to change their debit cards and credit cards from magnetic stripe cards to chip cards, and introducing measures to alleviate settlement risk on the BAHTNET system.

The implementation of the previous three Payment Systems Roadmaps has helped Thailand's payment systems become more efficient, secure, and compliant with international standards.

For the pursuit of an ongoing development of Thailand's payment systems in the next phase, in continuation from the previous Payment Systems Roadmap and the National E-Payment Master Plan¹, which is an important national strategy, the alignment of Thailand's payment systems with changing technology, the creation of safe and secure payment system that meets international standards, and the transition of Thailand into a digital

¹ The National e-Payment Master Plan is a national strategy created by the Ministry of Finance and the BOT, in cooperation with related government and private entities, in 2015 in order to push the development of payment infrastructures and to promote the use of electronic payment services in all sector. The plan consists of five important projects: (1) the PromptPay project, (2) the card usage expansion project, (3) the e-Tax and e-Document systems project, (4) the Government e-Payment project , and (5) the literacy and promotion project (additional details on the project implementation and the results of the projects can be found in part 2, assessment of the environment and challenges).

economy and society, the BOT therefore formulates this Payment Systems Roadmap No. 4 (Roadmap No.4) to be a direction for developing Thailand's payment systems during 2019 – 2021.

In developing the Payment Systems Roadmap No. 4, the BOT has collected and analyzed data regarding the advancement and development of payment and financial technology in Thailand and in other countries. Furthermore, the BOT also researched consumers' payment behaviors, studied and linked related national development plans, and consulted with stakeholders from the public and private sectors, financial institutions, and payment service providers in order to gather opinions, suggestions, and directions regarding payment systems and financial systems. These data is important for the development of the Roadmap No.4 because they reflect the needs of stakeholders, and are beneficial to development of the country and are also practical.

Summary of the Payment Systems Roadmap No. 4 formulation process



Final Roadmap



Public Hearings from key stakeholders



Drafting the Roadmap and consulting with experts from various fields.



Assessment of the environment and analysis of data

1. The direction of payment system and service development in Thailand and other countries.
2. Exploring people's payment behaviors.
3. Listening to stakeholders' comments

The Payment Systems Roadmap No. 4 has been approved by the Payment Systems Committee (PSC)² and the National e-Payment³ Master Plan Steering Committee. The BOT will implement the plan through cooperation with related entities, especially the Thai Bankers' Association, the Association of International Banks, the Government Financial Institutions Association, the Thailand Electronic Payment Trade Association as well as government and business entities, to ensure that the plan's objectives will be achieved effectively. The BOT will also review the Roadmap No.4 every year in order to evaluate the progress and to improve the plan so that it is suitable for the Thailand's payment environment which has rapid technological changes and evolution in payment services.

² The Payment Systems Committee is one of the BOT's main committees, and has the duty to formulate policies regarding payment systems under the governance of the BOT to ensure that they are safe and secure, and efficiently operated. The Governor of the Bank of Thailand is the chairman, and top executives from the public sector and the private sector are committee members.

³ The National e-Payment Master Plan Steering Committee's duty is to push the efficient and effective operation of related entities under National e-Payment Master Plan. The Deputy Prime Minister in charge of the economy is the chairman and the committee members come from related entities in the public and private sectors.



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Assessment of the Environment and Challenges



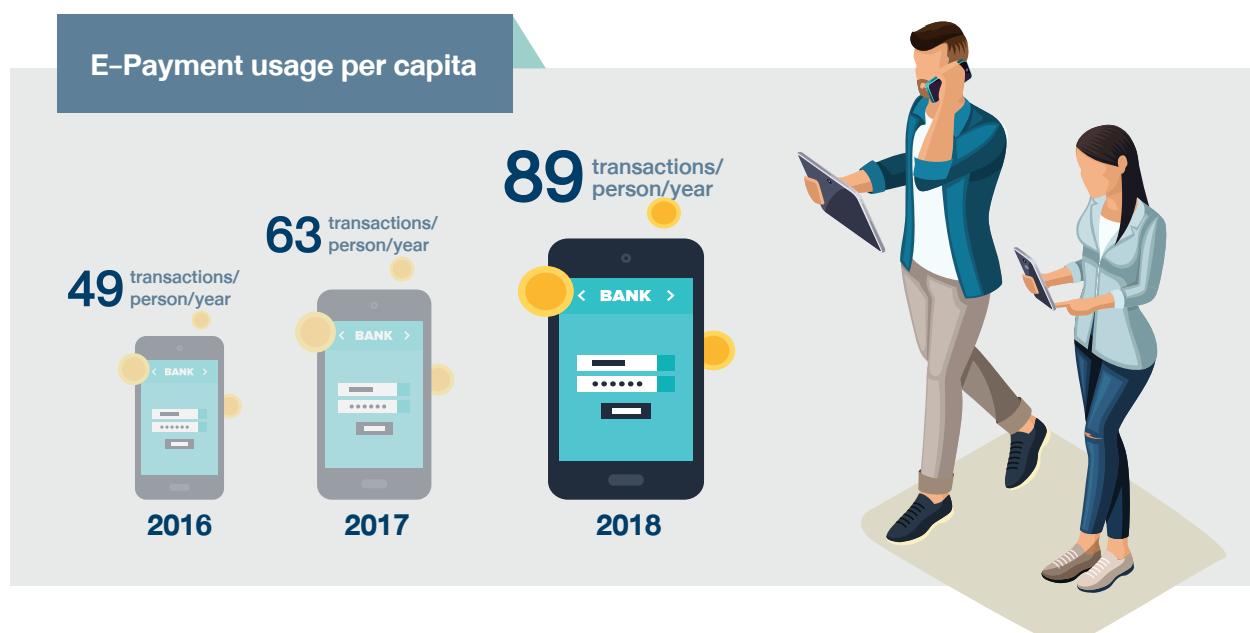


Assessment of the Environment and Challenges

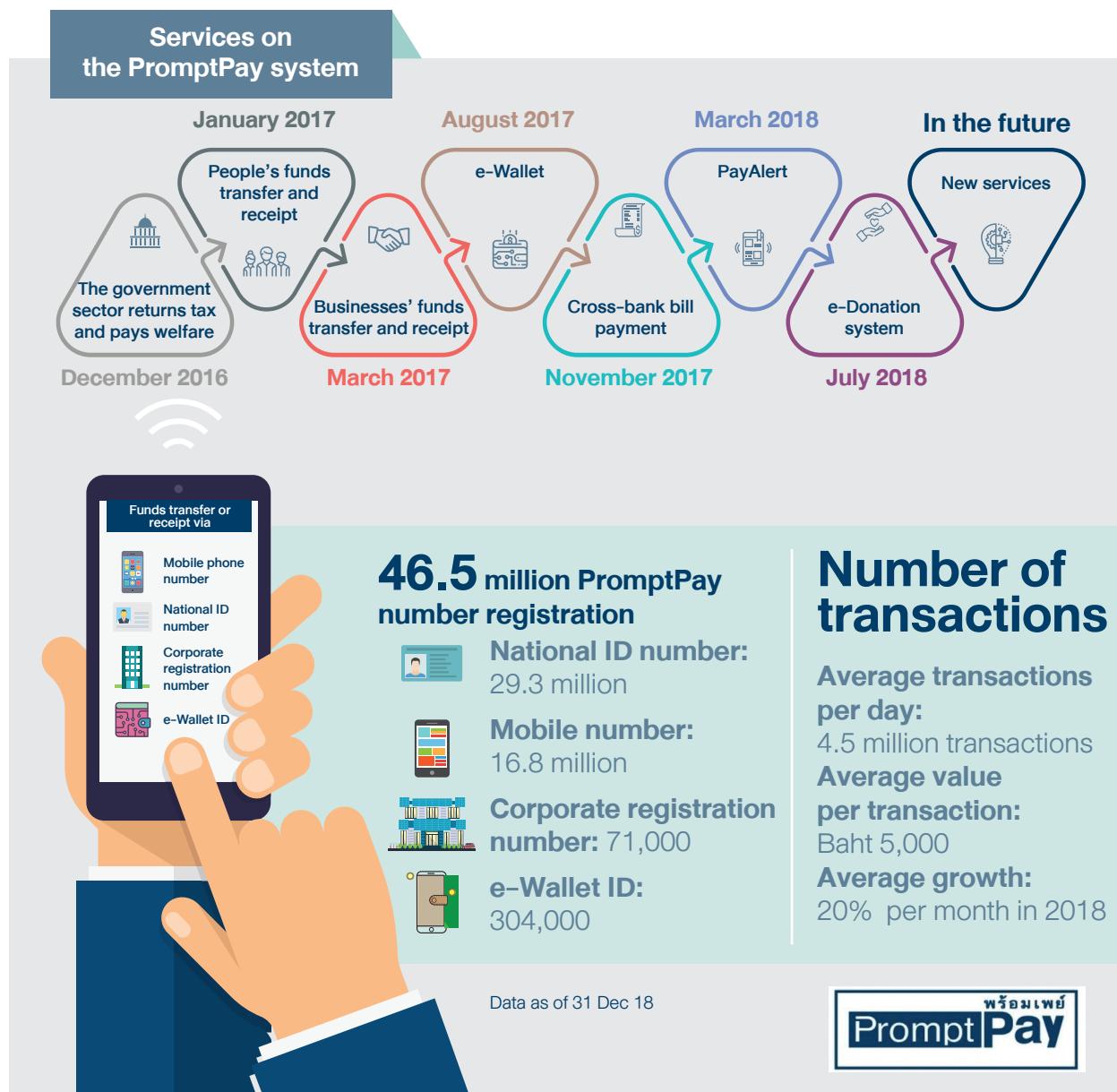
Assessment of the payment systems environment in Thailand is an important basis for the establishment of the Roadmap and a plan that will help to extend and set forth the goals of the development of payment systems to truly meet users' needs and support future innovations and development in financial and payment services.

The overview of payments in Thailand

Over the past few years, payments in Thailand have evidently evolved into electronic payment or digital payment. During 2016 – 2018, Thailand's digital payment has experienced rapid development and the public has widely become accustomed to making payments or using fund transfer services via mobile phones. Statistics demonstrate **that during the past two years, the usage of payment services on mobile phones has been growing at an average of 116 percent per year**. The main contributing factor to this shift has been the implementation of the National E-Payment Master Plan, under which the BOT takes the main responsibilities for the PromptPay project and the card usage expansion project.

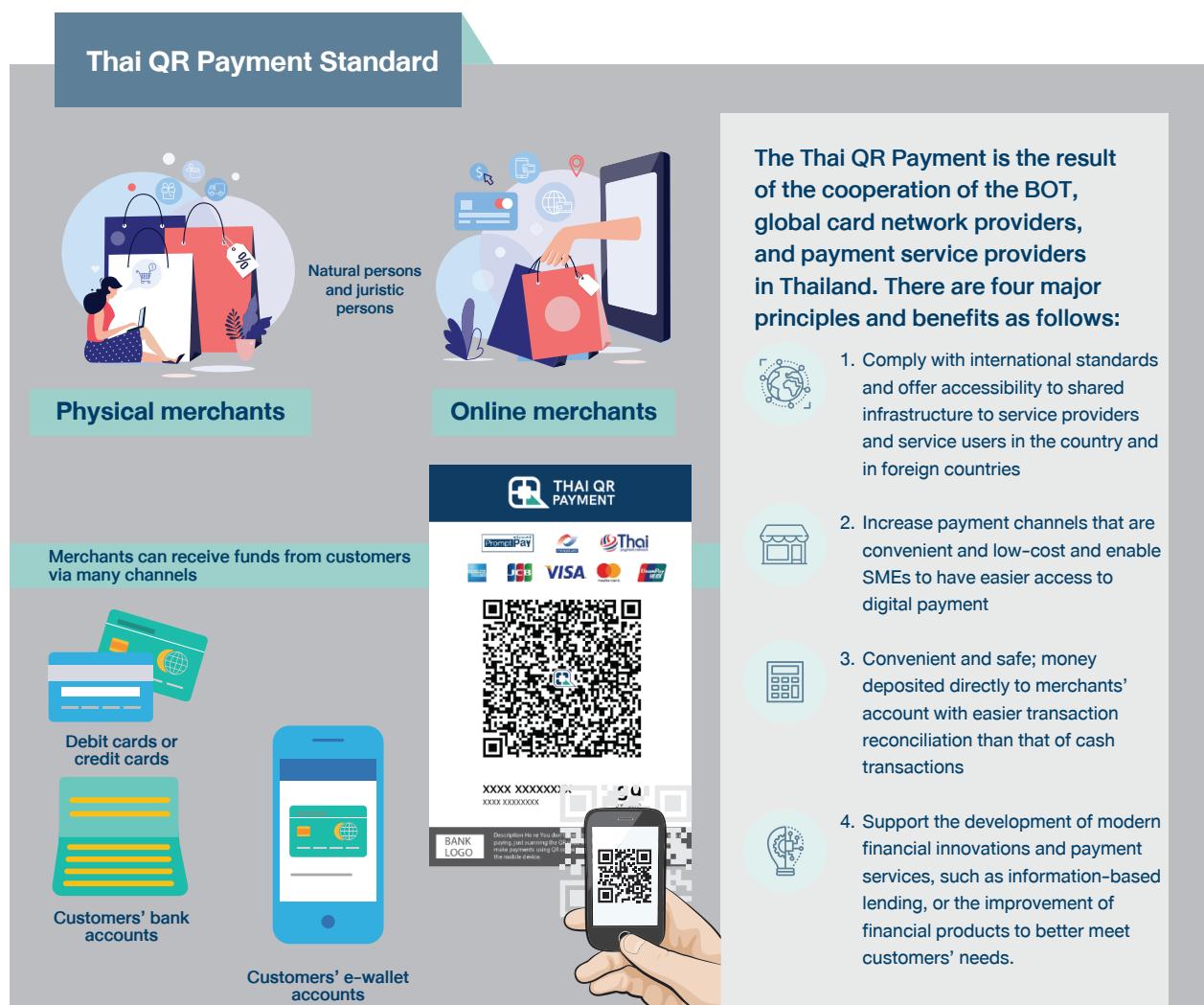


The PromptPay project is a development of payment system infrastructures and services that is modern, convenient, and low-cost. It enables the public and the business sectors to transfer funds using mobile phone number, national identification number, corporate registration number, or e-wallet number. It is convenient, fast, and has low service fees. Therefore, digital payment in Thailand has grown in popularity, as evident in the registration of 46.5 million PromptPay numbers (as of December 2018) and an average of 4.5 million transactions per day. In 2017, the government sector provided personal income tax returns to over 2 million people, or over 70 percent of those who received tax returns, via the PromptPay system instead of via cheques. Moreover, the competition within the banking sector also plays an important role in propelling the widespread use of PromptPay by reducing or waiving the fees for cross-bank funds transfer via electronic channels.



Moreover, the PromptPay system promotes the development of new services to meet various needs. For example, **the cross-bank bill payment service** allows users to pay their bills at any banks that provide this service. **The Thai QR Payment Standard, a new type of payment via mobile phone**, is convenient, fast, economical, and enables digital payment to access SMEs and small shops, such as those found in markets, stalls, and street vendors. The Thai QR Payment Standard can also be further developed to provide international payment services. **The PayAlert service** supports selling goods online. **The e-Donation service** accurately and transparently facilitates the public in making donations and receiving tax allowances.

All these services facilitate public users, the business sector, and SMEs in using payment services, and increasingly make the users turn to digital payment.



The card usage expansion project is a cooperative effort by the public sector, the banking sector, and the private sector to expand the nationwide coverage of e-Payment acceptance points. Merchants can receive payments by cards or mobile phones safer at lower costs. Individuals have more digital payment options in place of cash. Nowadays, there are over 800,000 EDC machines throughout Thailand, including EDC machines at government entities. This allows the public to make payments to merchants and government entities without having to carry much cash. Moreover, the BOT recognizes the benefits of QR Code technology which can increase the efficiency and reduce the costs of the payment systems in Thailand. Therefore, the BOT prescribed the standardized QR Code for payments, which is in compliance with EMV QRCPS⁴, an international standard. Thailand is among one of the first countries in the world that have adopted a standardized QR code for payments, enabling service providers and service users to access and to use the QR code for payment transactions in the country and in foreign countries in a widespread manner. This standard supports many payment methods, such as bank accounts, credit cards, debit cards, and e-wallets through mobile applications. More convenient and cheaper e-Payment acceptance points have been increased for both consumers and merchants. Payments have also become more secure and a variety of financial innovations can be easily developed. Therefore, **the expansion of e-Payment acceptance points with the Thai QR Payment has reached over three million points throughout the country** (as of December 2018.) This payment method can support consumers' daily payments to both physical merchants and online merchants, and it has caused the volume of digital payment usage in Thailand to exponentially grow.

The PromptPay project and the card usage expansion project are important initiatives that support the transformation of the public sector's payment and disbursement process to full-scale digital payment. In particular, **the government's welfare payments are directly made to recipients via state welfare cards**, which can be used to make a purchase of goods via EDC machines of participating merchants. **Furthermore, funds transfers using one's national identification number** also enable more than 14 million people to receive funds accurately and quickly. Government entities become more transparent, and thus have good management and have supporting data to create effective welfare schemes and services for the public and the business sector. Moreover, **e-donations via the Thai QR Payment** for educational institutions, religious institutions, hospitals, and other public charity organizations (e-Donation project) facilitate both donors and recipients to directly send both donations and information for tax benefits without having to show any donation evidence later. Therefore, donors may receive tax returns faster and recipients safely receive all donations.

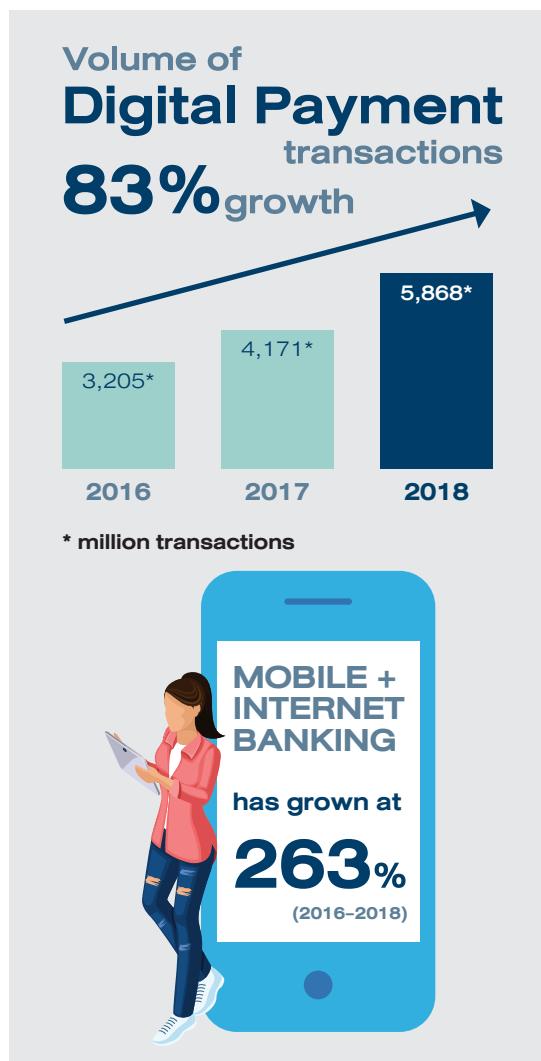
Assessment of the payment systems environment in Thailand: important developments and challenges

The BOT has assessed seven aspects of the payment systems in Thailand, including the behavior of users in different groups, advancement and changes of the payment service business models, and related infrastructure. In this regards, both the strengths and future challenges are assessed to be used as data to support the formulation of Payment Systems Roadmap No. 4, which covers service usage among the public, the business sector, and the government sector; cross-border payment service; payment infrastructure; risk management and governance; and payment data. The summary is as follows.

⁴ EMVCO has issued the QR Code Specification for Payment Systems (EMV QRCPS) standard, which consists of the EMV QR Code Specification for Payment Systems: Merchant-Presented Mode and EMV QR Code Specification for Payment Systems: Consumer-Presented Mode, <http://www.emvco.com/emv-technologies/qrcodes>

The general public

Digital payment has grown but most people still use cash.



More and more people tend to use digital payment. Overall, digital payment usage increased by 83 percent between 2016 and 2018. For the most part, the growth has been attributable to internet banking and mobile banking, which together have grown by 263 percent. Meanwhile, funds transfer transactions via PromptPay have quickly increased. It is estimated that over 50 percent of Thai people with bank accounts have registered for PromptPay (as of December 2018).

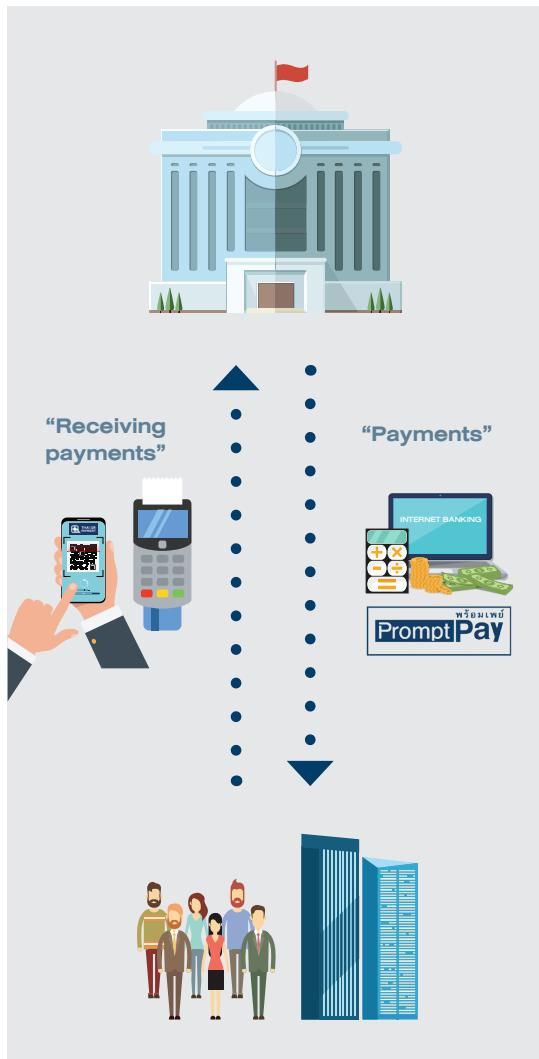
The expansion of e-Payment acceptance points that are becoming more popular among merchants is another factor that enables the public **to have greater access to digital payment services.** Nowadays, over 800,000 EDC machines have been installed and the Thai QR Payment has been installed at more than 3 million physical merchant points and online merchant points throughout the country (as of December 2018.) Small vendors and payment recipients, such as shops in markets, street vendors, stalls, and motorcycle taxis can thereby receive payments via electronic methods at a small cost. Moreover, **many commercial banks have already waived fees for digital payment transactions**, such as funds transfers and bill payments, since March 2018. As a result, people have access to services with lower cost and alter their payment behavior to rely more on digital payment.

However, **for the most part, digital payment has been used by a limited groups of users.** Based on the survey on people's payment behavior in 2017⁵, the BOT found that 80 percent of all digital payment transactions were derived from only 30 percent of the subjects, and 93 percent of all payment transactions are made in cash. The reasons that the majority of people still use cash are because they are familiar with cash and feel that **it is easier to use, or are unaware that there are costs in using cash.** Moreover, **most still lack knowledge and understanding of digital payment.** Therefore, it is necessary to promote the development of convenient digital payment services and channels that support usage in daily lives, to increase the number of users of digital payment services, and also to raise awareness and confidence in the services.

⁵ In 2017, the BOT conducted a nationwide survey on people's payment behavior among 10,805 subjects, both in and outside urban areas.

The government sector

The central government has adopted digital payment. However, the expansion has yet to cover every government agency.



The public sector plays a significant role in promoting the use of digital payment in Thailand. The government has seen the importance of transitioning into digital payment and has taken important initiatives as follows:

Payments: Welfare money is paid to people directly via the state welfare cards or to bank accounts. In 2017, over 70 percent of personal income tax refunds were paid via PromptPay instead of cheques. This reduced costs and enhanced the efficiency of the government's services to people.

Receiving of payment: EDC machines and the Thai QR Payment have been installed in over 8,000 government entities (as of August 2018.). The "Thung Ngern Pracharat" mobile application was also introduced to support payments by state welfare card holders, at low cost. Furthermore, there is a plan to develop an e-Government service that supports digital payment, such as the payment of business license application fee.

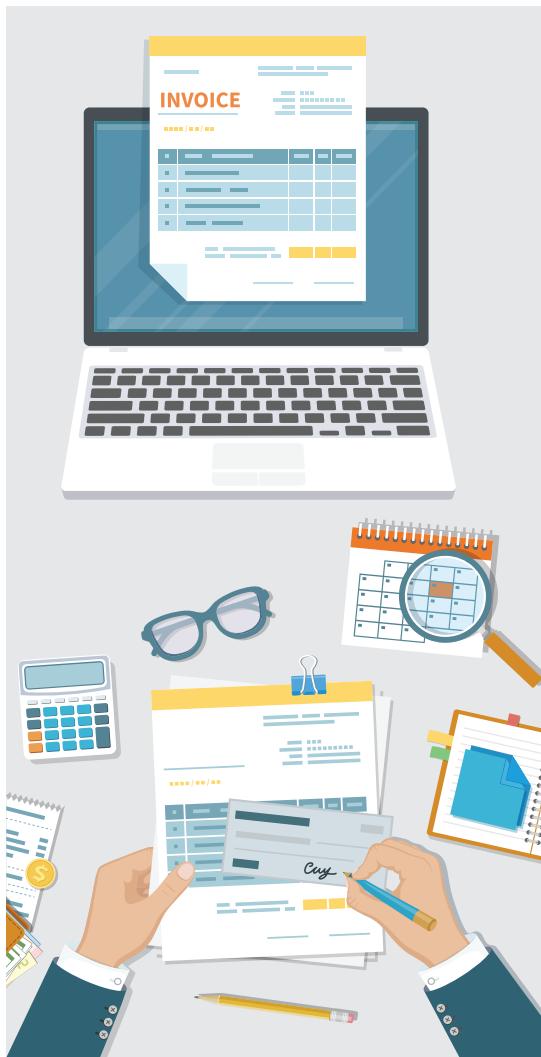
The government's policy to promote digital payment usage requires government entities to accept payments via electronic channels, starting in March 2018, and promotes the use of contactless or near field communication (NFC⁶) technology in the payment of public transportation fares.

However, digital payment usage in the public sector can still be expanded to cover the whole country, including state enterprises, and to integrate with other public infrastructures to better facilitate digital payment.

⁶ NFC, or near field communication technology, is a wireless communication technology that transmits data between a mobile device and a signal reader machine over a short range, facilitating payments such as transit payments and payments at points of sale.

The business sector

The business sector has started to adopt digital payments, but the use of cheques and cash remains prevalent.



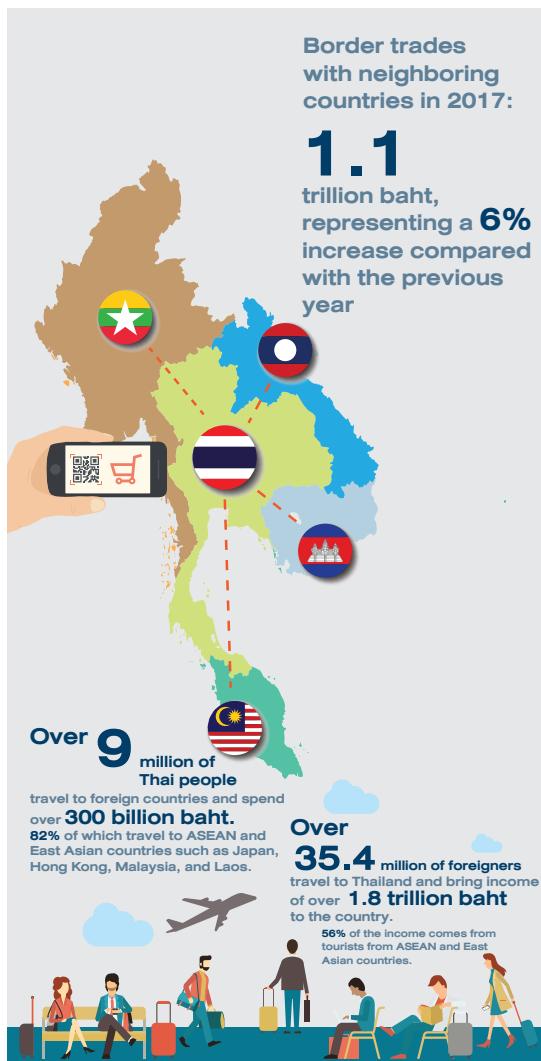
The business sector, especially large businesses, has begun to use digital payment more frequently. However, the use of cheques is still high. The main reason is that business processes are not entirely electronic. Cheques are still attached to business documents such as invoices and withholding tax certificates. Cheques are also used as tools for internal control and for other purposes. For example, they are used as guarantees and for cheque discounts. Presently, no digital payment service can replace cheques for these purposes. Besides, the fees for using cheques are low, and they do not reflect the actual costs. The fees are lower than those in certain types of fund transfers, such as for high-value cross-bank fund transfers. Therefore, businesses do not have the motivation to adopt digital payments.

Small businesses, as well as e-commerce and social commerce businesses, mainly receive payments in cash. E-commerce has a high ratio of cash-on-delivery (COD) transactions because for online transactions, there is no digital payment service that can earn sellers' and purchasers' confidence.

Moreover, **digital payment services that are available at the moment** still cannot meet businesses' need. For example, **they do not support the transmission of sale-purchase data at the same time as payment data**, which enables businesses to reconcile payment transactions automatically. Furthermore, **fund transfer services still have limitations** on the amount per transaction, especially in real-time cross-bank fund transfers. Therefore, services need to be improved to meet business necessities and to support the business sector to adopt full-scale e-business and paperless processes.

Cross-border payment services

Currently, cross-border funds transfer services are expensive and inconvenient.



There are consistently higher cross-border payment transactions due to the growth of international trade and investment, tourism, and migration of foreign workers.

Border trades with Malaysia, Myanmar, Laos, and Cambodia had a value of over 1 trillion⁷ in baht 2017. However, many transactions were made in cash. Thus, there is an opportunity to change purchasers' and sellers' behaviors to use digital payment services, such as cross-border Thai QR Payment in place of cash.

Foreign labor in Thailand: Most foreign workers come from neighboring countries. Currently there are 2.1 million workers from Myanmar, Laos, and Cambodia who hold passports and Thai work permits (as of September 2018)⁸, amounting to 60 percent of all foreign workers who are permitted to work in Thailand. Most foreign workers remit money using informal channels because the services of financial institutions and authorized service providers are inconvenient and expensive.

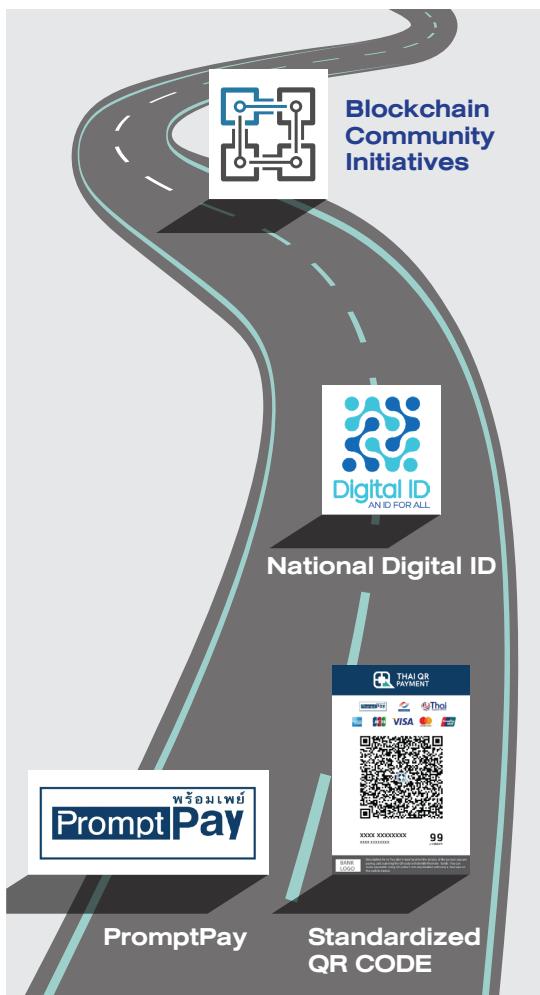
Tourism: In 2017, over 9 million⁹ Thai tourists traveled to foreign countries and spent more than 300 billion baht. More than 82 percent of Thai tourists travel to countries in Asia such as Japan, Hong Kong, Malaysia, and Laos. Most of them mainly use cash and electronic cards such as credit cards and debit cards to purchase products and services in foreign countries. As Thailand is a popular travel destination, various kinds of services should be offered to accommodate payments from both Thais and foreign tourists and to support services and trades in tourist destinations in Thailand.

Accordingly, there is still room for developing cross-border payment services to be more convenient and have lower costs. Such initiatives would support cross-border transactions and consequently the growth of Thailand's economy.

⁷ Data from the Department of Foreign Trade, the Ministry of Commerce
⁸ Data from the Foreign Workers Administration Office, the Department of Employment
⁹ Data from the Ministry of Tourism

Payment infrastructure

Increasing capability to support transaction growth, innovations, and linkages with foreign countries



Thus far, Thailand has developed payment infrastructures to support digital payment services. These efforts include **the development of an infrastructure for real-time retail funds transfer payment or the PromptPay system, and the standardized QR Code for payment**, which enable businesses, especially small shops, to receive digital payment with lower costs, and **the in-progress development of infrastructures**, such as the National Digital ID¹⁰, e-KYC¹¹, and Blockchain Community Initiatives¹², which facilitate development of future financial service innovations

The usage of digital payment continues to increase. Therefore, major retail payment infrastructure must increase its capacity in order to support the growth of transactions in the future. In other words, **capacity must be increased to support the accelerating number of transactions. The business continuity plan must also be reviewed, and the adoption of ISO 20022¹³** for payment systems must be promoted to enable the transmission of richer business data in supplement to payment data, and to support future innovations and connectivity with other countries.

¹⁰ National Digital ID is the country's central system to verify and authenticate digital identities. More information can be found at: <https://www.digitalid.or.th/>

¹¹ e-KYC means the know-your-customer process via electronic channels which identifies and authenticates customers' identities, which will enable users to receive convenient, safe, and trustworthy services.

¹² Blockchain Community Initiative is a cooperative effort between financial institutions and the business sector in adapting blockchain technology to boost the efficiency and competitive capabilities of businesses in Thailand. Electronic letters of guarantee on the blockchain system is the first project under Thailand Blockchain Community Initiative.

¹³ ISO20022 is an international financial message standard for different financial transactions, i.e. payments, securities, trade services, cards, and foreign exchanges, to enable the transmission of more data, and support innovations and interoperability domestically and internationally.

Supervision and risk management

There are many players. Supervision must be developed to be in line with changing risks and the complexity of the technology, as well as protect service users.

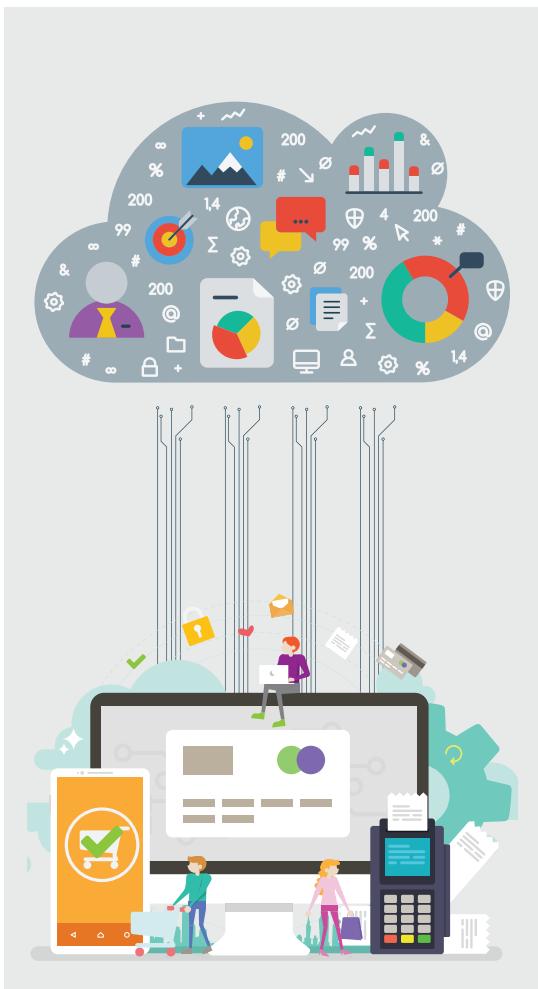


The BOT has continuously developed both payment supervision and guidelines on risk management for payment systems and services. In this regard, the BOT supported the **enactment of the Payment Systems Act, B.E. 2560 (2017)** in order to upgrade and align the payment supervision with international standards in order to boost payment users' confidence. The BOT has also **developed the framework to govern cyber security of the banking sector and service providers, and established TB-CERT**, or the Thailand Banking Sector Computer Emergency Response Team, which is a cooperative effort to exchange data regarding cyber-threats for the purpose of determining the appropriate actions. Furthermore, the BOT has also trained personnel to raise awareness and capabilities to handle new risks. Moreover, there is a **cooperative effort among related regulatory authorities**, i.e. the Office of the Securities and Exchange Commission (SEC), the Office of Insurance Commission (OIC), the Office of the National Broadcasting and Telecommunications Commission (NBTC), the Electronic Transactions Development Agency (ETDA), and regulatory authorities in other countries. This cooperation is done to effectively regulate payment services which are connected with other services.

In terms of competition, **there are increasingly more players in the payment service market**. Currently there are 108 licensed payment service providers (as of December 2018). Thus, there is not only more competition for service providers to provide payment services, but also more challenges on payment supervision. Lately, more complex technologies have been adopted, which lead to new risks, such as cyber-risks. **Therefore, the current payment supervision must be improved to meet these changes. Consumer protection must also be strengthened to enhance trust from service users. Service users should also be informed of how to safely use financial and payment services and new technologies.**

Payment data

Payment data has covered more dimensions but still lacks insights and connections with other data.



The BOT, as the regulator for payment service providers, has **improved the payment data report so that it would cover new types of services**, such as the data for payments made via the Thai QR Payment. **The report also provides a greater range of details** such as the service location and type of business that receives payments. This improvement is made to support analysis in various aspects and more effective policy-making. However, most data can provide only high-level analysis. **There is still a lack of in-depth data and as well as integration of relevant data from various sources.** Nevertheless, nowadays, there are technological innovations that can effectively and easily connect data, transmit them among entities, and support data analytics and the development of financial innovations.

Moreover, it is also necessary to develop modern data **analysis tools** by utilizing new technologies, such as data analytics, machine learning, and data mining tools in order to support payment supervision and other purposes.





BANK OF THAILAND

Development Framework under the Payment Systems Roadmap No.4

**INTEROPERABLE
INFRASTRUCTURE**

INNOVATION

INCLUSION

IMMUNITY

INFORMATION



Development Framework Under the Payment Systems Roadmap No.4

The vision for the Payment Systems Roadmap No. 4 is to make “**digital payment the most preferred choice in efficient, safe, and low-cost payment systems that meet users' needs.**” This Roadmap emphasizes on the development of essential infrastructures and an ecosystem that facilitates innovation developments, supports competition, and meets the needs of each group of service users, especially e-commerce and social commerce, which are growing rapidly, as well as SMEs and large businesses. Furthermore, this Roadmap promotes the use of digital payment throughout the country. These will be implemented through the five development frameworks as follows:



Interoperable infrastructure

The focus is to develop Thailand's major payment infrastructures, such as the PromptPay system, the BAHTNET system, and payment service providers' systems (for banks and non-banks) in terms of capacity and risk management, so that they can efficiently and consistently support the growing volume and value of transactions. The ISO 20022 must be applied to major payment systems in order to support the transmission of payment data and business data, as well as connectivity with other countries. The electronic know-your-customer process (e-KYC) and biometrics authentication should be promoted to support future payment innovations, and cash management must be more efficient to reduce the costs of the overall economic system.



Innovation

The focus is to develop modern services that meet the needs of the target groups (individuals, businesses and the public sector) through the construction of an ecosystem that supports the development of payment innovations and promotes competition among service providers. Financial institutions will be encouraged to test each innovation in their own sandboxes for better capture business opportunities. Pilot projects will be promoted in cooperation with the public and the private sectors for end-to-end e-business process and digital payment. This would reduce the cost and increase the efficiency of the process. Technologies will be utilized to develop different kinds of services, such as bio-payment, contactless payment, additional PromptPay services, an alternative payment service in place of cheques and cross-border funds transfers and payments that are convenient and low-cost.



Inclusion

The focus is to promote access to and to boost the usage of digital payment in every sector. Government entities and state enterprises that have interactions with a lot of people will be encouraged to use more digital payment, and will be a catalyst to help spread the usage of digital payment. The costs related to mobile payment services will also be reduced so that those in the rural areas could access and use the services at lower costs. In addition, promotion and literacy regarding the appropriate and safe usage of digital payment services and technologies will be implemented so that service users are confident in the services and choose appropriate services.



Immunity

The focus is to lay the foundation for strengthening the stability of and confidence in payment systems by driving the adoption of international security standards to handle cyber-threats at both the organizational and the national levels. Sound governance mechanisms will also be built into the payment industry. In addition, customer protection will be strengthened, and supervision techniques will be improved to be appropriate for the types of services and risk level (risk-based supervision.) Lastly, a Regulatory Impact assessment (RIA) will be applied in the process of issuing and reviewing regulations in order to promote innovations and decrease the burdens of the service providers.



Information

The focus is to develop a comprehensive payment data architecture by exchanging and integrating data with entities that are ready, and to improve efficiency of data analysis and utilization for various purposes, including financial innovation development, policy making and supervisory works under the appropriate and stringent data governance and data privacy practices.



Payment Systems Roadmap No.4 (2019 - 2021)



Digital payment is the most preferred choice

in efficient, safe, and low-cost payment systems
that meet users' needs



The Payment Systems Roadmap No.4 (2019 - 2021)

Building an ecosystem that supports digital payment to be the most preferred choice via effective, safe and low-cost payment systems that meet users' needs, whether individuals, the business sector, or the government sector. The development framework thereunder covers five areas:



1. Interoperable Infrastructure

- **Increasing capacity** and upgrading the risk management of PromptPay, BAHTNET, and member banks' systems
- **Adapting ISO 20022** to support the transmission of business data and payment data, and interoperability with other countries
- **Applying biometrics standard** for authentication of identities in the e-KYC process to support future payment innovations
- **Increasing the efficiency of cash management** to reduce the costs of payment systems



2. Innovation

- **Adapting a variety of technologies** to develop digital payment and build upon the PromptPay system
- **Developing cross-border payment and fund transfer services** that are convenient and low-cost
- **Building an environment that supports development** by implementing a sound process for regulatory issuance and review in / order to encourage innovations and decrease the burden of service providers, as well as to promote competition among service providers and to support them in the development of innovations in their own sandboxes
- **Promoting an end-to-end digital business process** in trading, payments, and tax documents through pilot projects by the government sector and the private sector



3. Inclusion

- **Communicating accurate information** so that service users are confident and can select appropriate services for their use
- **Supporting the widespread usage of digital payment, including in government entities**, so that digital payment are used in wider circles
- **Supporting the reduction of mobile payment costs** to increase accessibility for individuals living in the rural areas



4. Immunity

- **Pushing the adaptation of international security standards** to handle cyber-threats within the financial systems
- **Strengthening consumer protection** to be aligned with changing services
- **Improving supervision techniques so that they are appropriate to the types of services and the level of risk** in order to increase the efficiency of the supervision process



5. Information

- **Developing integrated payment data** by connecting and exchanging data with those entities that are ready
- **Developing tools and data analytics** in order to develop financial innovations, support policy-making and the utilization of the tools and data analytics for other purposes.



INTEROPERABLE INFRASTRUCTURE

Developing infrastructures
that are interoperable,
secure, and in compliance
with international
standards to support
innovations and
cross-border
connectivity



1





Due to technological advancements and social and economic developments in the digital age, the rapid increase of digital payment in every sector, and payment services in and outside the country being developed for greater interoperability among service providers, there is a need to develop a payment infrastructure that has the appropriate capacity, availability, and security in order to support a higher volume and value of transactions.

In order to conduct businesses in the digital age, it is necessary to adopt ISO 20022 to support the transmission of the increased volume of business and payment data. This would enhance the efficiency of digital transactions and digital business processes, which is important for the development of future innovations and interoperability.

Furthermore, the development of the standards relating to payment services, such as the API (application programming interface)¹⁴ and biometrics standard¹⁵, is important because they would increase the efficiency and improve the risk management for both the infrastructure and services in the future.



¹⁴ The API is a connection channel used to exchange data from one system to another that is convenient, fast, and safe. It reduces the complexity and costs of system development, and supports further development of innovations.

¹⁵ Examples of biometrics are fingerprint, face, or retina. These can be used for identity authentication in financial services which is more accurate and safe.

Intended Outcomes

- The PromptPay system and the service providers' systems for both banks and non-banks would be able to safely support the increased volume of electronic payments, and provide uninterrupted services.
- The payment service providers and the business sector would adopt ISO 20022 into the payment services and processes of businesses, which would result in a more widespread adoption of the ISO 20022. Furthermore, there would also be a plan to develop the BAHTNET system so that it would be able to support ISO 20022 in order to increase its efficiency and to support international interoperability.
- The PromptPay system, bulk payment system, member banks' systems, the BAHTNET system, and businesses would be able to conveniently transmit data for remittance or payment information among one another, and would be able to support various digital payment developments in the future.
- The payment systems and services would become interoperable. The international standards and best practices would be adopted, and further innovative development and interconnectivity with other countries would be compatible.
- Commercial banks' systems would have lower costs as a result of more efficient cash management.

Key Initiatives

Increasing Capacity and Availability

- **Increased capacity:** The BOT has been working with financial institutions to develop the PromptPay system, member banks' systems, and the BAHTNET system so that they would be ready to support increased transactions by monitoring and responding proactively. The business continuity plan (BCP) is frequently upgraded in the central system and the member banks' system. The BCP is also continuously tested.

Adopting Global Standards

- **Developing and supporting the adaptation of ISO 20022** with payment systems and the systems of commercial banks, and increasing the adoption of ISO 20022 within the businesses and the public sector in order to support the transmission of business data at the same time as payment data, which is an important basis for payment service development as it assists with the acquisition of complete data and supports innovation development and interoperability with other countries.
- **Developing a biometrics standard for identity authentication in the e-KYC process** to promote people's convenient and fast access to and usage of digital payment while emphasizing the secure and safe authentication processes.
- **Propelling the development of the API standard and API Gateway / Hub¹⁶ to support the interoperability of related payment services of the providers so as to other services that to be further developed,** such as the verification of cross-bank payment transactions, verification of a mobile number owner before registering for PromptPay, and other services, in order to facilitate users and to give them confidence in using digital payment services.

¹⁶ These are mediums for interoperating and switching among service providers, managing central APIs, and determining various standards. Initially, NITMX developed the API standard so that member commercial banks that provide PromptPay service could connect services based on a central standard which supports their joint further development.

Increasing Efficiency and Security

- **Increasing efficiency of the country's cash management structure, especially cash in ATM systems,** by encouraging related parties to cooperate to improve work processes and use common resources, to divide the roles and duties among the parties, and to create appropriate structures for the cost of services.
- **Encouraging the interconnectedness between digital payment and other important infrastructure systems,** such as the public transportation system, by encouraging the use of appropriate contactless technology, such as the NFC technology for the payment of transportation fees, and developing payment services that are connected to the government's systems in order to provide end-to-end online government services to both the public and the business sector, such as the government's One-Stop Service system, National Single Window / Digital Trade Platform system, and payment systems for financial instruments.
- **Improving risk management and settlement mechanisms for high-value fund transfers** on the PromptPay and BAHTNET systems in order to accommodate electronic payment transactions of businesses and the public sector, or capital markets, which are increasing in value, by increasing the efficiency of settlement mechanisms among member banks, alleviating settlement risks, and enhancing the liquidity for payment efficiency.

INNOVATION

Promoting the development
of various service innovations
that meet users' needs



2





Financial technologies and innovations play an important role in people's work and everyday life in that they facilitate fast and convenient fund transfers, payments, and financial services, increase work efficiency, reduce costs, and are accessible to more users.

Digital payment services in Thailand have developed to a great extent, such as the PromptPay fund transfer service and the payment service based on the standardized QR Code for payment, which are important tools for payments in every sector. Nevertheless, new services are still needed to continuously develop using different technologies in order to meet the needs of users in each group in terms of convenience, safety, lifestyle, and experience. These new services will stimulate the continuous usage of digital payment services and build an ecosystem to support a full-service digital business processes, providing alternatives for the use of cash and cheques.

The development of payment services is another important factor that opens up opportunities and increases value for businesses, especially e-commerce/ social commerce businesses and SMEs. The development can widen convenient and fair access to the government's services. This can improve quality of life for the Thai people and increases Thailand's competitiveness in the long run.

Furthermore, building an ecosystem that supports innovative development and provides opportunities for new service providers to enter into the market will also promote competition. This would be beneficial to service users by having a variety of payment options at a lower cost.



Intended Outcomes

- Individual users would have a variety of payment services that are modern, convenient and fast, low-cost, easy to access with new technologies that are in line with their lifestyle including both domestic and cross-border payments.
- Large businesses, SMEs, e-commerce/ social commerce businesses would have safe and low-cost payment services which would support their business operation and the transformation to end-to-end e-business processes, which would use less paper. Moreover, digital payment would be used instead of cash and cheques.
- Payment service providers would have an ecosystem that is conducive to the development and experimentation of new payment innovations, as well as having their own service testing and development mechanism using technological innovation under a regulatory supervision mechanism that is flexible and conducive to innovation and promote competition among service providers.

Key Initiatives

Building a Supportive Ecosystem

- **Supporting financial innovations of financial institutions and payment service providers** by improving supervisory framework that is conducive to innovation and services. This would be done through the support given to service providers so that they would have a testing mechanism and develop their services using their own sandboxes in order to create a new payment innovation and to open up more business opportunities with adequate risk management and user protection.
- **Adopting a regulatory impact assessment (RIA) procedure in regulatory issuance and review** through the assessment of the overall impact in order to increase the efficiency of digital payment supervision , to reduce the regulatory costs and to promote innovation.
- **Supporting the competition between payment service providers** through the revision of regulations that promote the competition among service providers, promoting an increase in the number of players in the service market, especially regarding cross-border fund transfer services, in order to provide more choices and to reduce the cost of cross-border payment transactions for individuals and businesses.

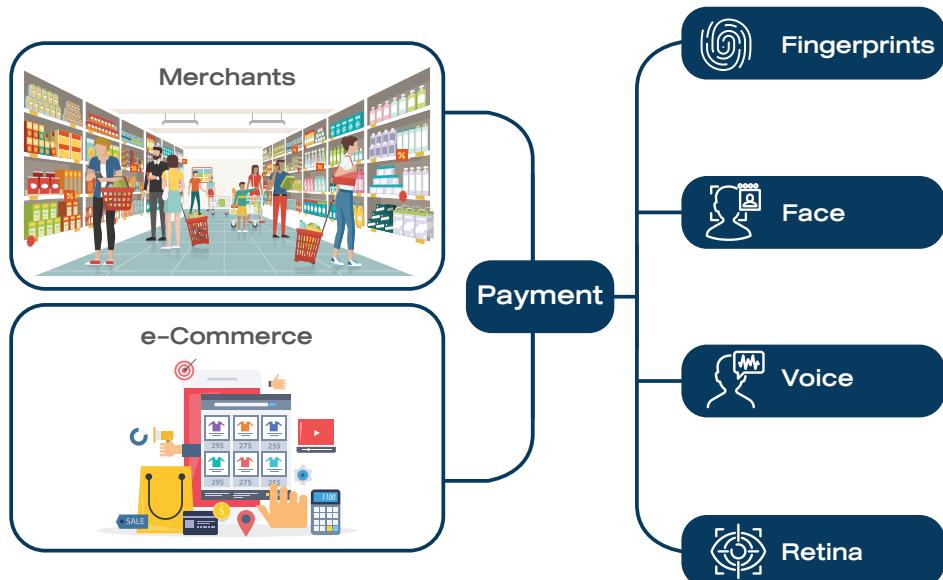
Promoting Digital Businesses and the Payment Process

- **Supporting the public sector and businesses in changing their operation process over to an e-business model, to reduce the use of paper (going paperless) and to rely on comprehensive digital payments** in the sale and purchase process, payment and receipt of payment among partners, and contact with government entities, such as implementing the use of e-invoices, digital payment, e-tax invoices, e-receipts and e-withholding tax. This would be implemented by launching pilot projects on e-business among government and business entities that are ready to do so, whereby these entities would act as examples for other government and business entities within the same industry.

Propelling Innovative Products

- **Developing payment services to support SMEs, e-commerce businesses, and social commerce businesses so that they would be able to conveniently use digital payment with confidence and reduce the reliance on cash** by further developing the PromptPay system to support online businesses and trading, such as the credit notification service and escrow payment service, which would boost the confidence among purchasers and online sellers, and the Thai QR payment service which can be a substitute for cash-on-delivery services (COD.)
- **Pushing for the development of a centralized platform for SMEs on which they could access comprehensive e-business services**, such as e-marketplaces, e-invoices (in place of paper, which is inconvenient, has high costs, and takes a long time) and digital payment, whereby SMEs would be able to operate their businesses online (e-business.) The benefit of this initiative would be the creation of an inexpensive and accessible platform, which would make information-based lending and supply chain financing possible, permitting businesses to have easier access to capital at reasonable costs.
- **Developing digital payment services in place of cheques** in order to meet the needs of the business sector, which still requires the use of cheques, (that is, developing digital payment in a way that would have comparable qualities as cheques), whereby initially, the focus would be on the reduction of cheques used in transactions (transactional cheques), and subsequently the focus would be on researching and developing digital payment as an alternative with the same qualities as cheques used today, such as making digital payment endorsable and usable as trade guarantees.

- **Developing cross-border payment services that are convenient and inexpensive and support fund repatriation by foreign labor, international trade, and tourism**, through the adoption of the QR Code Standard in the development of cross-border payment and fund transfer services that are convenient and inexpensive, starting with the countries within the ASEAN region and other Asian countries with economic linkages. Also, supporting the development of cross-border remittance services via the PromptPay system which is connected to payment systems and payment service providers in other countries, as well as adopting other financial technologies such as blockchain as an option for fast and inexpensive cross-border fund transfer and payment.
- **Developing retail consumer payment services through the use of various financial technologies**, such as bio-payment, IoT¹⁷, NFC and contactless payment, debit and credit cards on mobile devices (cards on mobile), which are convenient, fast, safe, and suitable with users' lifestyle, building seamless payment experience as a part of daily life.



¹⁷ IOT Payment or Internet-of-things payment is payment via things that can be connected to the Internet.

INCLUSION

Improving access,
raising awareness and
understanding, and
promoting continuous
usage



3





In Thailand, there has been a continuous development in infrastructure and payment services. For the past three years, the rate of electronic payment services use has rapidly grown. However, in daily life, most people are still accustomed to using cash and cheques. From a 2017 survey of individuals' behaviors, it was discovered that there was still a low rate of usage of digital payment among some groups within the public, such as among those living in rural areas and senior citizens, because they are unfamiliar with digital payments and do not realize that in fact, cash and cheques usage leads to higher cost than digital payment. Moreover, some individuals have limited access to basic financial services, do not understand electronic payment services, do not trust these systems, and do not have the tools to access digital payment or digital banking services.

Therefore, it is necessary to communicate and to disseminate knowledge on digital payment services and related financial technologies among the general public and among those within the target groups to boost and expand the usage of digital payment. At the same time, safe usage is also important. It is also necessary to promote basic services for electronic transactions that meet people's needs at a reasonable cost. This would increase the access to financial services and support continuous use of such services.

With regards to these efforts, the public sector plays an important role in spreading digital payment services to people throughout the country, which is in line with the government's past policies and projects. This governmental involvement will help to build direct experience, knowledge, and understanding, and to boost continuous service usage. Moreover, communication and announcements made through channels of financial institutions and payment service providers are also important for raising awareness and accessing a wider circle of the public.



Intended Outcomes

Every sector would have an accurate knowledge and understanding, and can conveniently access and use digital payment at a reasonable cost.

- **The demographic group that is familiar with digital payments** includes students and those who have recently started their employment, especially taking into account their continuously increasing use of digital payment, on a daily basis.
- **The demographic group that has yet to become familiar with digital payments** would become more confident and understand it better, whereby they would have access to inexpensive or have sampled using digital payment services.
- **The public and the private sectors** throughout Thailand would be able to use digital payment more often, and would rely less on cash and cheques.

Key Initiatives

Promoting Access to and the Use of Digital Payment Services (Inclusion)

- **Pushing to expand the usage of digital payment in government entities and state enterprises** by cooperating with government entities to formulate policies and to promote the use of digital payment among the government sector, especially within entities that are often involved in payment transactions with the public and the private sectors.
- **Pushing for the reduction of the costs related to mobile payment services** in order to promote public access to electronic payment services, especially for those living in the countryside and people with low incomes, in order to improve their quality of living by enabling them to access digital payment at a reasonable price.

Communication and Literacy

- **Providing education and increasing correct, safe, and continuous use of the service** by cooperating with financial institutions, payment service providers, public and private entities to formulate a systematic communication strategy, and developing the communication channels to better disseminate the information on payment and the use of modern technologies in comprehensible manners for each of the target groups, such as within the locales where younger demographics are to be found, through the use of social media, through community leaders, as well as via service providers in order to create an ecosystem that fosters confidence in the use of digital payments.

IMMUNITY

Maintaining stability,
sound risk management,
responsive supervision and
examination, and
customer protection



4





Stable, secure, and uninterrupted payment systems and services are an important foundation for the improvement of user confidence and the advocacy for digital payments to become the preferred means of payments.

Both within the Thai payment ecosystem as well as elsewhere, there is an increasing number of service providers, and the services are various, complex, and interoperable whereby new technologies have been adopted to the services. Therefore, this might pose new risks, such as cyber-risks. Regulatory authorities are thus faced with new challenges in that they have to quickly and thoroughly monitor the risks without creating obstacles to innovative development.

Therefore, the BOT must develop and improve the supervisory process so that it would be well respond to the service models, risks, and changing technologies, and to encourage service providers to adopt international security standards. It must also implement service user protection policies that are fair and reasonable, and to improve their cooperation with other related regulatory authorities and entities in Thailand and elsewhere so that the payment system would be stable, secure, and reliable.

Intended Outcomes

- The payment systems and services must be safe, secure, and ready to handle cyber-threats, as well as have risk management mechanisms that are in line with international standards.
- Service users should be adequately and equitably protected, so that they would have a confidence in using digital payments on a daily basis.
- Regulatory supervision creates a level playing field and are able to keep up with the technological advancements and the new risks they pose. There would be cooperation between both domestic regulators and those abroad in order to achieve holistic and comprehensive results.



Key Initiatives

For service providers: Building risk management mechanisms and elevating the level of consumer protection.

- **Elevating cyber-risk management** by implementing cyber-security measures both in terms of IT system protection and cooperation among related entities, including through exchange of data, as well as by creating and test-driving the plans to tackle and respond to cyber-risks and to subsequently recovery the system.
- **Advocating the adoption of international standards by payment service providers** through the issuance of policies or guidelines that meet international standards, such as IT risk management, cyber-threat management, and the adoption of an electronic customer identification and verification process that would adequately commensurate the risks entailed by the service.
- **Strengthening consumer protection** by prescribing consumer protection measures for service providers, such as the specification of the terms and conditions in service-level agreements (SLAs) for digital payment services, problem-solving procedure for service users, business rules, dispute resolution agreement, and the compensation for damages, among others.
- **Building sound management mechanisms and governance** for payment service providers in the payment industry in order to foster the cooperation among service providers, which would enable an exchange of ideas to continuously develop payment systems and services in the interest of the public, and to ensure that the competition would be fair and service users would be adequately protected.



For regulatory authorities: Increasing the efficiency and enhancing the supervision to meet the challenges and risks posed by new innovations (risk-based supervision.)

- **Developing a risk-based supervisory framework for payment service providers** based on the type of service and the level of risk associated with each type of service provider so that they may effectively manage risks. This will be implemented by adopting the RIA process, taking into consideration the regulatory impact on service providers.
- **Developing the tools to enhance the efficiency of the risk management process and adopting supervisory technology (SupTech)**, such as using a monitoring dashboard to support ongoing monitoring, as well as developing the regulatory capacity on the part of the authorities so as to allow them to be prepared to deal with new risks posed by new technologies.
- **Strengthening the cooperation on the supervision of payment services among the regulatory authorities within Thailand and elsewhere**, such as through the exchange of knowledge and experiences, and the establishment of security standards, consumer protection standards, and cross-border supervisory standards for payment service providers in order to foster the promotion of digital payment and the interoperability of cross-border payment systems.
- **Expanding the cooperation with related entities domestically and internationally** in order to promote safe digital payments, such as the cooperation with ETDA on IT security and related standards, the cooperation with the Anti-Money Laundering Office (AMLO) on anti-money laundering and combating the financing of terrorism (AML/CFT) for cross-border transactions, and the cooperation with the NBTC on the protection of mobile payment service users and cyber-security of related service providers.



INFORMATION

Integrating payment data
for utilization in various
dimensions, developing
data integration and
analysis using
technologies



5





Payment data is a good reflection of people's lifestyles and economic conditions. Electronic payments generate a lot of digital data, which can be efficiently analyzed to serve multiple purposes.

Nowadays, payment data are stored in many entities, including financial institutions, payment service providers, and public and private entities. Using technology to integrate payment data could allow us to construct an overall picture of the country and enhance in-depth analyses in various dimensions to support the implementation of macroeconomic policy. This also promotes the development of financial innovations and access to financial services for both the public and SMEs, such as payment services that meet the needs of service users, information-based lending service, and alternative credit scoring.

Data integration will be conducted with appropriate data governance and data privacy measures as to make the integration process effective and beneficial for stakeholders. It will also be used to further develop financial innovations and in policy-making, taking into consideration data security.

Intended Outcomes

- Integrating payment data with appropriate personal data security and governance measures, which could be used to support the development of financial innovation, and the implementation of economic, financial, and regulatory policies, with service users receiving the benefits from the data-driven development of services.
- Conducting an in-depth analysis of the payment data which could be done using new equipment and analytical techniques, such as data analytics and data mining tools for optimal benefits.

Key Initiatives

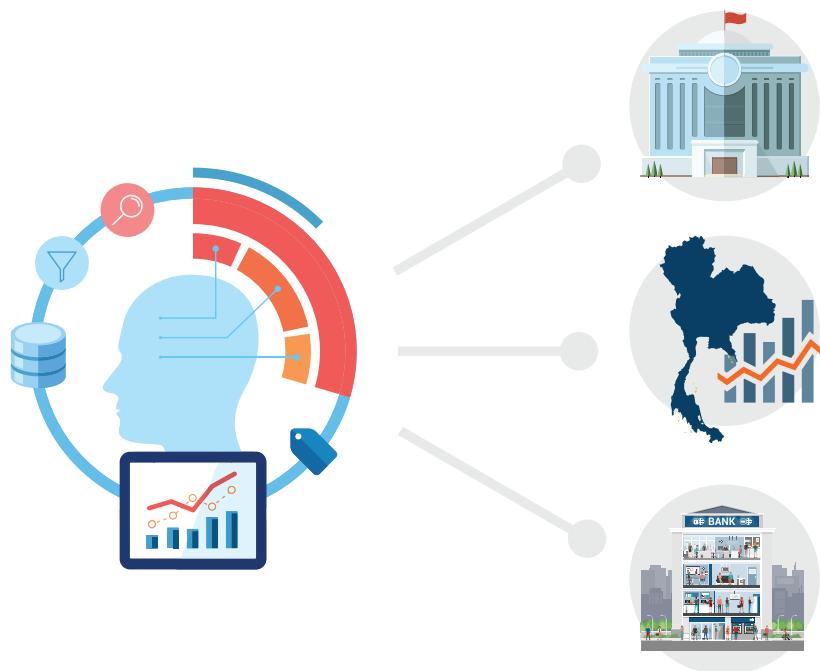
Data Sharing Initiative and Payment Information Architecture

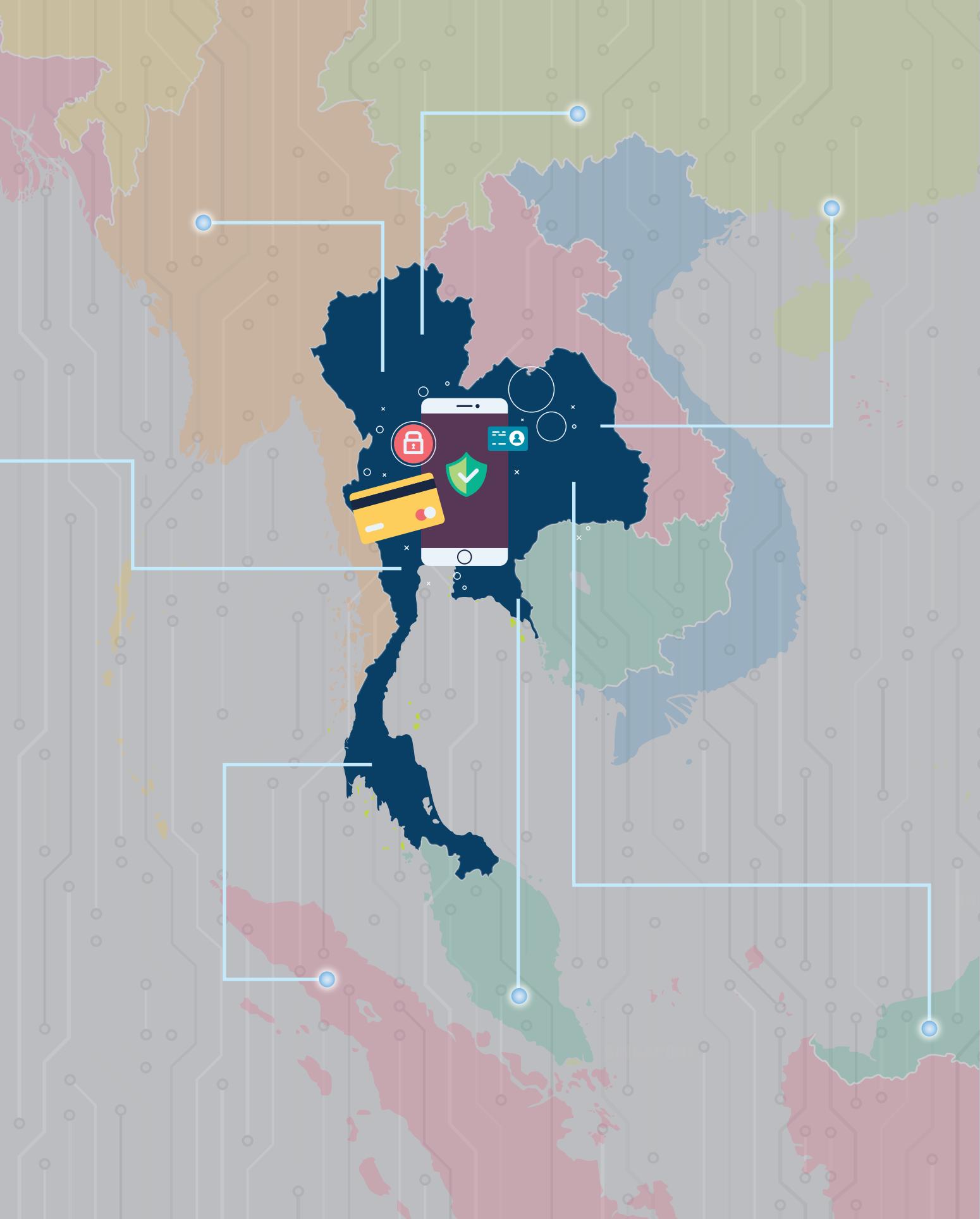
- **Initiating a pilot project on payment data integration** with public and private entities that have the capacity under the appropriate data governance and data privacy policies. This will be implemented through the use of API technologies and the data scope will cover domestic payment data, cross-border payment data, tourism data, and the public sector's payment data. It is aimed to create in-depth information which every sector can benefit from and promote the development of financial services.
- **Supporting the use of payment data to develop financial innovations** that meet the needs of service users and increase access to financial services, such as further development of Thai QR payment, the development of SME-lending that is based upon payment data, and the development of various financial services via mobile application.

Data Analytics

- **Developing analytic tools that use technology** for an in-depth data analyses such as big-data analytics, data mining tools, and dashboard in order to monitor the economic pulse, and to keep track of service providers' operations and their risk management procedure in the payment systems, as well as for policymaking on the part of the public sector.

Developing analytical tools





The Future of Payment Systems in Thailand

Thailand has an ecosystem that makes digital payments to become the most preferred choice for every sector. Digital payments facilitate and enhance the efficiency of transactions both among the public as well as the private sectors. It also plays an important role in supporting the growth of SMEs, e-commerce, and large businesses. Digital payments also improve the country's competitiveness and connectivity with other countries, in pursuit of Thailand's sustainable economic well-being.



The general public

Using digital payments in daily life



Payment infrastructure

Effecient, stable, secure, and interoperable



Public sector

Using digital payments extensively throughout the country



Businesses

Having payment services and methods that suit the needs of businesses



Cross-border payments

Having cross-border payment services that are convenient and inexpensive



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