

Unofficial Translation

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Payment Systems Roadmap 2010

Bank of Thailand

September 2007

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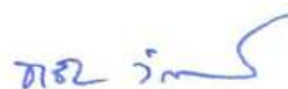
Foreword

It has been over four years since Bank of Thailand (BOT) had prepared and made public the *Payment Systems Roadmap 2004* which represents an initial effort to establish a national payment roadmap. This milestone roadmap has successfully laid solid foundations for many vital payment system developments, for example, the establishment of ITMX (Interbank Transaction Management and Exchange) system, ASEANpay system for retail funds transfer among ASEAN countries, a cooperation arena for national payment systems development among payment providers, and the drafting of payment business regulatory laws.

Payment Systems Roadmap 2010 is the outcome of close collaboration and discussion of major parties in the national payment systems: commercial banks, business sectors, independent academicians, and relevant regulating bodies. A timeframe of four years has been established to promote more prevalent usage of electronic payment services to all users groups equitably both in the central and the regional sectors, and to keep cash and cheque payments at appropriate levels.

The recommendations put forward in the present roadmap are policy recommendations that provide frameworks for more detailed implementation plans to be carried out under the collaboration of relevant agencies.

Bank of Thailand sincerely wishes to gain valuable cooperation from all concerned parties in providing recommendations and details for the implementation plans, and joining the working committee in steering the Thai payment systems toward common goals.



Mrs. Tarisa Wattanagase

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August 2007

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Executive Summary

Four years ago, Bank of Thailand (BOT) had prepared and disseminated the *Payment Systems Roadmap 2004*. This was the first time that clear directions for the national payment systems had ever been established in Thailand. Recommendations found in this roadmap were formulated by the payment system concerned parties in the government as well as the private sectors. Since then, many concrete results have been achieved as are evident from progresses in the national payment systems and from the establishment of oversight measures to ensure efficient, stable and safe payment systems.

However, the Thai payment systems have recently been undergoing many rapid changes, particularly in terms of user's needs and behaviors as well as advances in the information and communications technologies. It is, therefore, essential to formulate strategic plans that can effectively deal with new challenges that will take place by the year 2010.

Payment Systems Roadmap 2010 is the outcome of joint consultation among major parties in the payment systems such as the commercial banks, business operators, independent academicians, and relevant regulatory agencies.

Operation steps for the development of this Roadmap are as follow:

Identification of key concerns for payment systems development by 2010

1. Increasing user's needs and expectations of payment system services.
2. High level of cash usage in Thailand.
3. The majority of current payment systems are closed-loop systems offering services to their own groups of customers only.
4. Inappropriate service fee structures.
5. Legal problems regarding legislation and enforcement of electronic payment service laws.
6. Increase of payment service providers' compliance burden of local and international rules and regulations.
7. Demands for payment systems that can support the rapidly expanding trade in the region.
8. Impacts of payment system risks on public confidence in the financial systems and financial institutions.

Vision

“Collaboration among public and private institutions in driving for the prevalent use of efficient and secured electronic payment services with fair fees on an adequate legal foundation with effective enforcement”

Strategic objectives

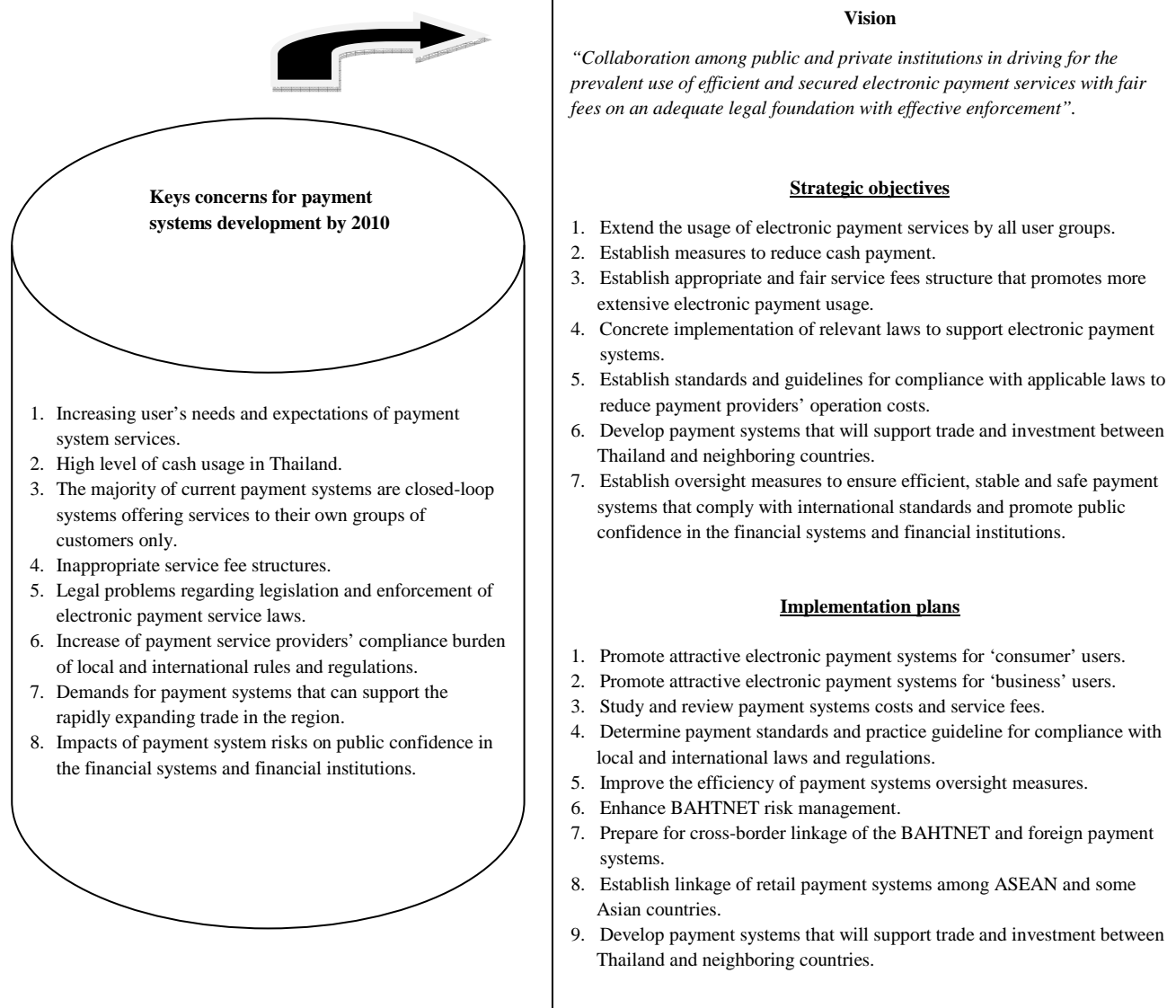
1. Extend the usage of electronic payment services by all user groups.
2. Establish measures to reduce cash payment.
3. Establish appropriate and fair service fees structure that promotes more extensive electronic payment usage.
4. Concrete implementation of relevant laws to support electronic payment systems.
5. Establish standards and guidelines for compliance with applicable laws to reduce payment providers’ operation costs.
6. Develop payment systems that will support trade and investment between Thailand and neighboring countries.
7. Establish oversight measures to ensure efficient, stable and safe payment systems that comply with international standards and promote public confidence in the financial systems and financial institutions.

Implementation plans

1. Promote attractive electronic payment systems for ‘consumer’ users.
2. Promote attractive electronic payment systems for ‘business’ users.
3. Study and review payment systems costs and service fees.
4. Determine payment standards and practice guideline for compliance with local and international laws and regulations.
5. Improve the efficiency of payment systems oversight measures.
6. Enhance BAHTNET risk management.
7. Prepare for cross-border linkage of the BAHTNET and foreign payment systems.
8. Establish linkage of retail payment systems among ASEAN and some Asian countries.
9. Develop payment systems that will support trade and investment between Thailand and neighboring countries.

During the formulation of detailed implementation plans step, all concerned parties will be welcomed to provide suggestions and to join the working committee in developing the Thai payment systems toward common directions.

Summary of Payment Systems Roadmap 2010 formulation steps



1. Introduction

1.1 Significance of Payment Systems

As a principal mechanism for the facilitation of trade and financial transactions, payment systems are vital to national economic development. Effective, stable and safe payment systems are also crucial to cost-reduction efforts in the government and private sectors.¹ Such systems will significantly contribute to counter parties' confidence in the reliability and promptness of their funds settlement. They are also essential to the flexibility and safety of regional and international trade and investment. Development of efficient payment systems will generate better business opportunities and enhance Thailand's overall competitiveness in the world economy.

1.2 Bank of Thailand's roles in the payment systems

Bank of Thailand (BOT) has been entrusted with the major responsibility of overseeing the operation of the national payment systems that are *efficient, stable, safe and compliant with the international standards*.

1.2.1 Efficiency

1.2.1.1 Promotion of operational efficiency

It is BOT's responsibilities to ensure maximum financial benefits through fast, expedient and reliable systems of funds transfer at the shortest settlement period. Other responsibilities include the assurance of payment systems continuity and uninterrupted services, whether through certain mishaps in the payment systems themselves or through unforeseeable factors of such as terrorist acts or natural disasters. Apart from damaging

¹ A study by Donges, William R., Retail Payment Systems – A Vision for Egypt, concludes that payment system costs in most developing countries generally amount to 5% of its GDP.

payment users' operations such disruptions may halt local economy and eventually expand to international transactions. For this reason, BOT has attached much importance to the scrutiny of payment providers' contingency plans and business continuity plans.

1.2.1.2 Promotion of economic efficiency

BOT has long endorsed and promoted low-cost payment system services. Electronic payment systems, through the advantage of their economies of scale whereby an increase in service volume results in a decrease in service costs, are universally recognized as having distinct competitive edges over cash and cheque payments.

Key factor that makes electronic payment more popular is to encourage payment service providers to set a more cost-related fees structure which will reduce payment costs for both individual and organization users, as well as, benefit the national economy as a whole.

Issues on service fees also include the fees being charged among service providers themselves. Inappropriate service fees will increase operation costs and eventually reduce the competitive edge of electronic payments over cash and cheque payments, which is less economically efficient.

1.2.2 Security

1.2.2.1 Mitigation of payment risks

Payment system risks may have negative impact on public confidence in the financial systems and financial institutions. Such risks may be induced by failure to achieve payment finality due to credit risks, liquidity risks and operational risks on the part of payers or their paying banks. These risks can be damaging to counter parties especially when such payment system risks may escalate into a systematic risk and may undermine confidence in the national financial system. Failure in international

payment finality may result in increasing foreign exchange settlement risks.²

1.2.2.2 Prevention of payment frauds

While advanced information and communications technologies significantly contribute to more expedient payment services, they can also be easily abused to facilitate various payment frauds such as theft of credit card or ATM card information for counterfeit purposes. Widespread payment frauds are detrimental to public confidence in the national financial and financial institution systems.

1.2.2.3 Mitigation of money laundering

New forms of electronic payment services have also been abused in money laundering and the financing of terrorism. It is, therefore, essential that appropriate measures be implemented to prevent such illegal and destructive operations.

1.2.3 Establishment of payment systems that comply with international standards

The payment systems that comply with international standards will enhance Thailand's credibility in the world economy and attract larger volumes of international trade and investment.

² Business payment conducted in foreign currencies are generally high-value transactions. However, the fact that they are mainly carried out by a small number of commercial banks has increased financial risks to the international financial systems. If any of these commercial banks faces bankruptcy, the whole economy can be easily jeopardized as was the case with Herstatt Bank in Germany.

1.2.3.1 Compliance with BIS core principles for Systematically Important Payment Systems (SIPS) ³

BOT has developed the BAHTNET ⁴ as the national systematically important payment system to support high-value funds transfer among member banks. This system has been designed to comply with the high standards of efficient, stable, and safe payment systems under the internationally acceptable BIS Core Principles for Systematically Important Payment Systems (CPSIPS).

1.2.3.2 Participation in the Financial Sector Assessment Program (FSAP) and Reports on the Observance of Standards and Codes (ROSCs)

Since early 2007 Thailand has participated in the FSAP/ROSCs programs which are introduced by the International Monetary Fund and the World Bank. The BAHTNET system was assessed by the BIS Core Principles for Systemically Important Payment Systems (CPSIPS) standard and passed the review with satisfactory results. This achievement has enhanced confidence in the efficiency and security of the Thai payment systems both locally and internationally.

1.3 Payment Systems Roadmap 2004 implementation outcome

In 2002, the Payment Systems Department of BOT had prepared and disseminated *Payment Systems Roadmap 2004* ⁵ with the objectives of providing payment system operation frameworks for relating agencies.

³ For more information on BIS Core Principles for Systematically Important Payment Systems see www.bis.org/publ/cpss43.htm

⁴ For more information on BAHTNET (Bank of Thailand Automated High Value Transfer Network) see www.bot.or.th/bothomepage/BankAtWork/Payment/General/Thai_balance_new.htm

⁵ For more information on Payment Systems Roadmap 2004 see www.bot.or.th/bothomepage/BankAtWork/Payment/Highlight/Payment2004_Conference/Payment_2004.pdf

Details of the five key implementation plans that laid major groundwork of the national payment systems were as follow:

1.3.1 Establishment of an arena for industry payment body cooperation

This plan aimed to create an arena for cooperation among different payment service providers which included financial and non-financial institutions as well as BOT in its capacity as provider of national payment system infrastructure⁶. The objectives include:

- 1.3.1.1 To formulate relevant code of conducts and standards for the payment systems.
- 1.3.1.2 To reduce duplication of investment among payment providers through the use of common payment networks, equipment and devices for maximum benefits to the national economy.
- 1.3.1.3 To instigate for an establishment of domestic and cross-border linkages of payment systems.
- 1.3.1.4 To promote modern payment methods, technology and services.

Outcome: Initially, there were plans to establish Thailand Payment Systems Association (TPA) similar to the model found in many countries, such as Canada, Australia and the United Kingdom. However, this plan was thwarted by certain legal constraints and a **Sub-Committee on**

⁶ BOT provides three major payment systems: BAHTNET, a high-value payment system; ECS - Electronics Cheque Clearing System; and SMART - System for Managing Automated Retail Funds Transfer. For more information see www.bot.or.th/bothomepage/BankAtWork/Payment/payment2_level3.htm

National Payment Cooperation (SNPC)⁷ was instead established in December 2003 under the administration of BOT's Payment Systems Committee (PSC)⁸.

1.3.2 Establishment of a national payment information system

This plan aimed to systematically and continuously collect payment system statistics from payment service providers, financial and non-financial institutions, as well as data on payment services provided by BOT. These data were disseminated to the public for the benefits to all concerned parties.

⁷ The Sub-Committee comprised of 11 members who were representatives of various payment service providers groups. Its functions included:

1. Establish code of conducts as to payment systems including technical standard which is an underlying structure of payment for an effective and safe use as well as fair competition among parties involved in payment systems.
2. Formulate relevant policies for the following operations:
 - 2.1 Push forward the common use of payment systems to enhance its effectiveness and lessen investment overlap.
 - 2.2 Provide support and make the first move to employ pertinent payment media, technologies and modernized payment services.
 - 2.3 Foster connections among an assortment of payment systems both domestically and internationally.
 - 2.4 Gather data and research pertaining to payments for the benefits of related operating units in both public and private sectors.
3. Consider model and approach leading to an establishment of multiparty organization for service providers carrying on payment services for its effectiveness in being assigned the tasks from Sub-Committee on National Payment Cooperation (SNPC) as stated in 1 and 2

⁸ The Committee comprised of seven members with the Governor of BOT as its chairman.

For details of other committee members see

www.bot.or.th/bothomepage/BankAtWork/Payment/General/PSC/T_PSC_new.htm .

Its functions included:

1. Formulate national payment policies and directions to ensure safe and efficient payment systems, lessen payment costs and support trade and business transactions which will in turn encourage national potentiality as to competitions which cover the followings:
 - Controlling of associated risks in payment systems.
 - Having common standards, both in security and efficiency including technology requirements, rules and procedures.
 - Encouraging healthy competition among payment service providers for the benefits of users in terms of prices and services which are in line with their needs.
 - Fostering cooperation among major stakeholders in payment industry for efficiency and safe payment systems.
2. To have an annual report which summarize the work of the committee that is transparent and of good standard.

Outcome: Payment service statistics had been collected and reported in BOT's *Payment Systems Report*⁹ on an annual basis since 2002.

1.3.3 Drafting of the payment system regulating laws

This plan aimed to introduce appropriate legislations for the overseeing of efficient, stable and safe payment systems.

Outcome: BOT had collaborated with the Electronics Commerce Committee in drafting the *Royal Decree on Regulating Electronics Payment Business*¹⁰ by virtue of the Electronic Transactions Act B.E. 2544. Public hearing on this royal decree has already been completed and it is now in the process of enactment and implementation.

1.3.4 Formulation of payment system infrastructures and standards

This plan aimed to develop the national payment infrastructures which support efficient, stable and safe interbank transactions, and reduce duplication of investment, and to establish national payment standards.

⁹ For issues of the "Payment Systems Report" from 2002 to the present issue see www.bot.or.th/bothomepage/BankAtWork/Payment/payment.htm

¹⁰ **Scope of oversight:** Overseeing the electronic payment businesses and services provided by financial and non-financial institutions which included:

- 1) Credit card network service
- 2) EDC network service
- 3) Transaction switching service for payment in one system
- 4) E-money service
- 5) Clearing service
- 6) Settlement service
- 7) Electronic payment services through any devices or networks, such as mobile phone and Internet Payment Gateway
- 8) Payment service provider
- 9) Other services as prescribed by BOT with the approval of the commission whose authority was vested by BOT's laws.

BOT is authorized to oversee electronic payment services by the present royal decree.

Outcome:

- (1) Establishment of ITMX (Interbank Transaction Management and Exchange) system¹¹ for linkages of retail payment systems to support interbank services and facilitate electronic commerce transactions.
- (2) Establishment of a nationwide standard payment barcode to facilitate fast and expedient business transactions since early 2005.

1.3.5 Cross-border linkage

This plan aimed to study demands for cross-border linkages of both high-value and retail fund transfer in facilitation of international trade.

Outcome: For retail fund transfer, BOT had collaborated with the central banks in four ASEAN countries¹² in managing ASEANPay project for connecting ATM retail funds transfer within ASEAN countries. For high-value funds transfer, studies were conducted on the suitability of cross-border linkage of the BAHTNET and foreign payment systems.

¹¹ These services are provided by the National ITMX Company (formerly ATM Pool Company). Shareholders consist of 11 commercial banks: the Bangkok Bank, Krung Thai Bank, Kasikornbank, Siam Commercial Bank, Bank of Ayudhaya, Thai Military Bank, Siam City Bank, UOB Radanasin Bank, Thanachart Bank, Standard Chartered Bank (Thailand), and Bank Thai.

¹² Singapore, Malaysia, Indonesia and Thailand.

2. Payment Systems Roadmap 2010

Payment Systems Roadmap 2010 is formulated as a result of a series of discussions between major payment systems agencies which were participated by commercial banks representing the payment providers group, business operators representing the organization users, academicians specializing in payment services representing the general users, and members of relevant regulatory agencies. The group met to discuss and formulate appropriate policy recommendations to be used as frameworks for the implementation of detailed operation plans from 2007 to 2010.

2.1 Formulation procedure

Formulation procedure of Payment Systems Roadmap 2010 began with the discussions to determine *key concerns* affecting Thailand's payment systems development from 2007 to 2010. These concerns were subsequently used to formulate a vision for payment systems development up to 2010.

The Roadmap's vision is to be realized in three steps: formulation of *strategic objectives*, formulation of *operation plans* including specific operation details, and determination of *responsible agencies*.

2.2 Key concerns for Thailand's payment systems development by 2010

There are eight key concerns for Thailand's payment systems development that concerned parties must take into consideration in order to formulate common counteractive measures by 2010.

2.2.1 Users' payment service demands and expectations

Thailand's expanding economy has led to dramatic escalation in payment service demands both for organization and general users. There are also growing demands for fast, expedient and modern payment services to accommodate the changing lifestyles and business operations. Payment

service security and stability are essential to the growing confidence in the payment systems.

Also important is the development of *equitable treatment of payment service users*, with special regards to service fees, accessibility, and efficiency between users in the central and regional sectors.

At present, users' demands are increasingly differentiated by their social and economic statuses and specific needs. Major user groups are:

- (1) Person-to-Person (P2P)
- (2) Business-to-Customer (B2C)
- (3) Business-to-Business (B2B)
- (4) Business-to-Government (B2G)

2.2.2 High level of cash payment in Thailand

Although electronic payment systems have become increasingly prominent and popular in Thai economy, they are generally confined to limited groups of users. In rural sectors where cash is the only available means of payment, cash payment is still preferred for its convenience and familiarity. In urban areas, cash payment ratio is relatively high in selected business sectors, such as public transportation and retails. Customers of large retail stores and small convenient stores still pay for goods and services by cash.

High cash payment ratio is regarded as one of the main obstacles to overall national economic development because of its higher management and service costs in comparison to electronic payment. Embedded in cash payment are the additional costs of transportation, screening and counting, disposal (of old bank notes), and insurance.

Besides, most cash payment involves face-to-face transactions which take longer time to process, money needs to be counted and changes need to be calculated. Since the actual intent of cash payment is more difficult to

monitor and regulate than electronic payment, cash payment is subject to higher risks of loss, theft and robbery, illegal business transactions, and tax evasion.

For these reasons, many countries have attempted to reduce cash payment and introduced electronic payments as alternatives.

2.2.3 High level of closed-loop payment systems for selected customers

The closed-loop payment systems in Thailand are mainly confined to in-group customers and are entirely developed by the payment providers themselves. The open-loop payment systems which are available to wider range of customers are mutually developed by payment provider groups who share partial services on a common network. However, the closed-loop payment systems are less popular due to the following limitations.

2.2.3.1 *Inconvenience of service and unnecessary burdens for service users.* Payment transferors and transferees are required to conduct their transactions on the same payment system or through the same payment provider. For example, in most commercial banks the “*intra-bank payment services*” are only available to customers of the same bank while the “*inter-bank payment services*” are impeded by inadequate services and high service fees.

The open-loop payment systems fail to encourage payment “*between financial and non-financial institutions customers*” and “*between customers of different non-financial institutions*”. This limitation is clearly evident in the case of electronic money cards. Although many payment providers have issued electronic money cards to their customers, the cards can only be used with the card providers’ member stores and networks, therefore, forcing users to carry many cards at the same time. This inconvenience is the key factor for the cards’ failure to gain popularity.

2.2.3.2 *Higher operation costs for payment providers.* Since payment providers have to develop their own electronic payment facilities, duplication of investment is inevitable. In the case of credit cards,

individual acquiring banks have to install EDC (Electronic Data Capture) machines to exclusively accept their credit cards at each retail member shops. It is normal for a retail shop to simultaneously hold many EDC machines to process credit cards issued by different banks.¹³

¹³ In fact, Electronic Data Capture-EDC machines can process all credit cards issued by all banks, but the highly competitive credit card market forces the banks to program the machines to process only their credit cards.

2.2.4 Inappropriate service fees

At present, electronic payment service fees do not accurately reflect the providers' operation costs and are so unreasonably high that, despite their superior efficiency, they are not competitive with cash and cheque payments. The current situations are not constructive for the national economy.

Moreover, the inappropriate service fees have resulted in an unfair practice of cross-subsidization in which some user groups are paying higher fees to subsidize other groups.

2.2.5 Legal problems related to the legislation and implementation of electronic payment laws

Although the Electronic Transaction Act 2001, which provides legal basis for the admissibility of electronic data as court evidence, has been effective since April 3, 2002, it has not generated the anticipated increase in electronic business transactions. One of the major obstacles for such development involves the legal interpretation of the Act by certain agencies that results in a refusal to accept electronic payment data as evidence in the court. This leads to subsequent demands for the legislation of supplementary laws to clarify certain points of dispute. Another obstacle lies in the failure of relevant government and private agencies to

properly take the leading roles in admitting electronic data as legal evidence. Unless these problems are resolved, the Electronic Transaction Act 2001 will never truly take effect.

2.2.6 Increased burdens from observance of local and international laws and regulations

Payment providers are currently burdened by increasing management costs for the observance of larger number of local and international regulations and standards required by regulating agencies, for example, the Anti-money Laundering and Combating the Financing of Terrorism (AML/CFT) standards and foreign exchange control laws. With the increases in the duplication of regulations and standards set by different local and international regulatory agencies, payment providers are burdened with unnecessary operation costs that will eventually be transferred to payment users.

2.2.7 Demands for appropriate payment infrastructures to support the rapidly expanding trade in the region

There are needs to develop payment systems guidelines and financial infrastructures to accommodate rapid expansion of trade and investment between Thailand and her neighboring countries. Also needed are appropriate measures to direct the flow of payments and foreign exchanges from unorganized markets into the formal commercial banking system.

2.2.8 Payment risks may affect public confidence in the monetary and financial systems

In conducting business and financial transactions, counter parties have to choose suitable payment methods from a variety of payment services offered by payment providers. Payment systems are usually regarded as essential infrastructures for national economic activities. Without safe and reliable national payment systems counter parties will lack suitable means for successful business and financial transactions, and public confidence in

national financial and financial institutions will suffer a setback accordingly.

Payment risks occur when counter parties fail to achieve payment finality due to credit risks, liquidity risks, and operational risks on the part of payers or their paying banks. These can be damaging to the counter parties' business especially when large-value payment or large number of payees are involved. Payment risks may escalate into a systematic risk and undermine confidence in the national financial system. Failure in international payment finality may result in increasing foreign exchange settlement risks.

Moreover, advanced information and communication technologies have contributed to transformations in various aspects of the payment systems, for example, the increasingly significant roles of non-financial institutions as payment providers and the innovative payment services provided through mobile phone and internet technologies.

With expedient and fast means for money transfer between counter parties these developments have drastically increased financial transactions both in terms of volumes and values. However, these technologies have also led to an increase in payment risks, payment frauds, and money laundering which have undermined public confidence in the **“monetary and financial system”**.

2.3 Vision of Payment Systems Roadmap 2010

“Collaboration among public and private institutions in driving for the prevalent use of efficient and secured electronic payment services with fair fees on an adequate legal foundation with effective enforcement”.

Pervasive adoption of electronic payment systems will benefit the overall economy of Thailand and concerned parties in the following ways:

2.3.1 *The general public* will benefit from the increasingly convenient payment services. Electronic payment services will eventually eliminate the existing payment service constraints of time, place and accessibility.

Payment-related expenses will become more realistic and impartial.

Although there is no direct costs for cash payment, the general public has been unsuspectingly paying indirect costs for cash management that are automatically included in the costs of goods and services. An increase in the popularity of electronic payment services will lower the overall operation costs and eventually lead to lower service fees.

2.3.2 *Private organizations*, especially those in business sectors that are involved in high-value cash payments such as public transportation, commercial banking, and retailing sectors, will be able to pay direct cash management expenses on more reasonable and impartial basis.¹⁴ The same benefits will also apply to other business sectors with high-value cheque payment.¹⁵ By switching to electronic payment systems these

¹⁴ Many private organizations, particularly those involved in high-value cash payment, presently utilize cash management services provided by commercial banks. BOT’s surveys revealed that in some cases commercial banks offer cash transportation service at no cost, but it is believed that such costs are indirectly incorporated in other service fees.

¹⁵ In a report titled “Commercial Banks’ Payment Costs and Service Fees” prepared by Thailand Development and Research Institute in October 2004, a survey of payment service usage among 100 large local companies revealed that an average cost for cash payment (relating service fees and staff wages) was 88.6 baht per cheque while an average cost for SMART service, an electronic retail funds transfer that could be used in lieu of cheque payment, was only 28.2 per transfer.

business sectors will be able to improve their business flexibility and opportunities, and diminish previous obstacles. This depends on how well they can employ the existing payment media and services to their advantages.

2.3.3 Government organizations generally have the highest ratio of income and expenditure payments in the country. A switch of their payment methods to electronic means will significantly improve the efficiency, accuracy, speed, and transparency of these organizations' financial management because, compared to cash payment, these methods can be more easily and effectively monitored and regulated. Moreover, a switch to an electronic payment based economy will result in a decrease in economic crime rates and illegal business operations.

However, cooperation from all concerned parties -- payment providers, payment users, relating regulatory agencies, and supporting network providers -- is critical to the success of an effort to replace cash and cheque payments with electronic payments as the principal forms of the national payment systems. BOT will act as a mediator in initiating and securing the necessary cooperation.

2.4 Strategic objectives

Seven strategic objectives were formulated to achieve this Roadmap's vision. Details of these objectives are:

2.4.1 Increase electronic payment service usage for all user groups with special emphasis on:

- (1) Establishing guidelines to deal with electronic payment barriers.
- (2) Establishing guidelines to promote extensive use of electronic payment services.
- (3) Establishing guidelines to provide equitable payment services for both users in the central and regional sectors, especially in terms of service fees, accessibility and efficiency.

2.4.2 Establish cash-payment reduction measures with special emphasis on:

- (1) Establishing guidelines to reduce cash payment in business sectors with high volumes of cash payment.
- (2) Establishing guidelines to promote electronic payment services as practical alternatives to cash payment.

2.4.3 Establish fair and appropriate service fees structure and promote electronic payment services usage with special emphasis on:

- (1) Establishing guidelines for each category of payment service fee that corresponds with its operation costs.
- (2) Establishing guidelines for fair service fees and equitable treatment of payment users, especially between those in the central and regional sectors.
- (3) Establishing service fees structure that encourages competitiveness among payment providers and promotes electronic payment service usage.

2.4.4 Concrete implementation of supporting laws for electronic payment systems with special emphasis on:

- Admissibility of electronic documents, such as electronic receipts, as evidence in legal proceedings and genuine business transaction documents equivalent to paper documents.

2.4.5 Establish standards and guidelines for the observance of applicable laws to reduce costs to payment providers with special emphasis on:

- Establishing common guidelines and standards for payment providers to reduce their burdens in observing applicable local and international laws.

2.4.6 Develop payment systems that will support trade and investment between Thailand and neighboring countries

which include:

- (1) Promoting the transfer of payment and foreign exchanges from unorganized sectors to the formal commercial banking system.

2.4.7 Establish appropriate oversight measures to ensure safe and reliable local payment systems that are efficient and congruent with international standards to improve public confidence in the monetary and financial systems with special emphasis on:

- (1) Establishing guidelines to improve the efficiency of payment oversight measures that corresponds with the changing environment on a continuous basis.
- (2) Establishing risk monitoring and risk management measures in the high-value payment systems.

2.5 Implementation Plans and Details

Nine implementation plans were formulated to provide support for the implementation of the strategic plans. Details of these plans are:

2.5.1 Implementation plan to promote attractive electronic payment systems for “consumer” users.**2.5.1.1 Expected outcome**

Establishment of electronic payment services as alternatives to cash payment through the development of electronic payment systems that comply with the needs of different consumer groups. The systems should be able to provide equitable payment services for all consumers, especially in terms of service fees, accessibility, and efficiency.

2.5.1.2 Scope of work

- (1) Conduct studies on incentives and obstacles to electronic payment service usage.

- (2) Improve the popularity of different electronic payment systems such as debit cards, electronic money and the SMART debit system.
- (3) Provide more options for nationwide equitable electronic payment services for consumers such as making payment through mobile phone, Internet, ATM machines, bank branches and pay points.
- (4) Conduct feasibility studies on local switching of domestic credit card/ debit card and electronic money services to reduce operation costs for payment providers and stores; and on the development of PIN (Personal Identification Number) based debit card services to improve safety in goods and services purchase.
- (5) Study and instigate for the establishment of common electronic payment standards and electronic payments interoperability.

2.5.1.3 Goals

- (1) Increased usage of electronic payments for goods and services purchase. Establish comprehensive conclusions on the feasibility of local switching to credit card, debit card, electronic money, and PIN-based debit card services.
- (2) Establish more electronic payment service options to allow for equitable, convenient and fast services on a nationwide basis.
- (3) Establish common payment standards and systems to support open-loop electronic money services.
- (4) Establish common payment standards and systems to support easy and expedient end-to-end interbank bill payment between invoice issuers and payers.

2.5.2 Implementation plan to promote attractive electronic payment systems for “business” users.

2.5.2.1 Expected outcome

An increase in electronic payment systems usage that provide alternatives for cash and cheque payments among private operators and government agencies.

2.5.2.2 Scope of work

- (1) Conduct studies on problems and obstacles to electronic payment service usage
- (2) Liaise with government agencies and relating agencies to promote electronic funds transfer
- (3) Promote admissibility of electronic payment documents such as electronic receipts and electronic international payment documents as legal evidence.
- (4) Study and promote establishment of common electronic payment standards to support government and private agency transactions.

2.5.2.3 Goals

- (1) Increasing electronic payments usage among government agencies and business operators.
- (2) Promote admissibility of electronic payment documents as legal evidence by government agencies.

2.5.3 Implementation plan to study and revision of payment costs and service fees

2.5.3.1 Expected outcome

Fair and appropriate calculation of electronic payment service fees for all user groups. Promote more electronic payment usage.

2.5.3.2 Scope of work

- (1) Study the cost of providing various payment services, including the cash handling cost
- (2) Study the Fair Cost Model for the network connection between Large and small banks.
- (3) Recommend guidelines for suitable payment fees for different payment services.
- (4) Conduct public hearing of related stakeholders
- (5) Encourage the implementation of appropriate pricing structure

2.5.3.3 Goals

Provide recommendations/ guidelines for suitable payment fee structure that is correspond with genuine operation costs and promote the e-payment usages

2.5.4 Implementation plan to establish standards and guidelines for the observance of local and international laws and regulations

2.5.4.1 Expected Outcome

Establishment of standards or guidelines for electronic payment providers that comply with applicable local and international laws and regulations, to provide safe and sound electronic payment services without placing unnecessary burdens on payment providers.

2.5.4.2 Scope of work

- (1) Conduct implementation guidelines under relevant laws and regulations and notifications related to electronic payments

and also gather problems, obstacles and limitations for implementation including compliance costs

- (2) Formulate suitable standard and implementation guideline for payment service providers in order to reduce burdens under regulations, criteria and notifications.
- (3) Liaise with other departments in BOT and other related oversight agencies to solicit opinions from them.

2.5.4.3 Goals

Service providers have common standards and implementation guidelines in order to reduce burdens under the laws, regulations, criteria and notifications related to electronic payments.

2.5.5 Implementation plan to improve payment system oversight efficiency

2.5.5.1 Expected outcome

Establishment of oversight measures for electronic payment systems and payment providers that comply with international standards and are acceptable to payment providers. Implementation of applicable laws to ensure efficient, safe and stable payment systems that will generate confidence among users and safeguard financial system and financial institution stability.

2.5.5.2 Scope of work

- (1) Initiate legislation of electronic payment service oversight laws.
- (2) Issue notifications and criteria that comply with international standards. Arrange public hearings to solicit opinions from payment providers and concerned parties.
- (3) Oversee electronic payment providers' observance of relevant laws, notifications and criteria.

- (4) Liaise with local and international agencies to promote various collaborative efforts to benefit electronic payment systems and electronic payment providers oversight.
- (5) Publicize BOT's oversight roles to concerned parties.

2.5.5.3 Goals

- (1) Implementation of laws that empower BOT to oversee electronic payment business and issuance of criteria that comply with international standards.
- (2) Efficient and standardized oversight of electronic payment business under the applicable laws, notifications, and criteria under collaboration and information sharing with other regulatory agencies, both locally and internationally.

2.5.6 Implementation plan for the BAHTNET risk management

2.5.6.1 Expected outcome

Establishment of risk monitoring and management measures to ensure smooth operations under the BAHTNET system in order to increase public confidence in the financial system and financial institutions.

2.5.6.2 Scope of work

- (1) Prepare risk management guidelines to ensure smooth operation under the BAHTNET system in order to promote efficient liquidity management for financial institutions.
- (2) Coordinate and prepare for legislation of payment system laws to support payment finality in the BAHTNET system and multilateral netting.

2.5.6.3 Goals

- (1) Establish risk management guidelines to ensure smooth operation of the BATHNET system.
- (2) Establish supporting operation systems to improve liquidity management of the financial institutions.
- (3) Coordinate, arrange for, and prepare drafts of payment systems laws to support payment finality in the BAHTNET system and multilateral netting.

2.5.7 Implementation plan in preparation for cross-border linkage of the BAHTNET system

2.5.7.1 Expected outcome

Establish clear directions for a Payment Versus Payment (PvP) based cross-border linkage of the BAHTNET system¹⁶ that comply with standard market practices of financial institutions worldwide, in order to reduce foreign settlement risks to local financial institutions and BOT.

¹⁶ Settlement of foreign exchange in two currencies allows counter parties to simultaneously receive payment transfer.

2.5.7.2 Scope of work

- (1) Analyze benefits and impacts of payment systems linkage.
- (2) Consult local payment service users and concerned parties.
- (3) Liaise with other central banks for consultations and collection of detailed information.
- (4) Formulate suitable payment systems linkage guidelines for Thailand and prepare for legal readiness for applicable regulations, operations, and technologies.
- (5) Formulate operation plans for cross-border linkage of the BAHTNET system.

2.5.7.3 Goals

Prepare for readiness in relevant aspects and formulate plans to support suitable cross-border linkage of the BAHTNET system.

2.5.8 Implementation plan for linkage of retail payment systems among ASEAN and some Asian countries

2.5.8.1 Expected outcome

Establishment of efficient and low-cost linkage of retail payment systems among ASEAN and some Asian countries to provide more payment options and promote transfer of payment from unorganized sectors to the formal financial system.

2.5.8.2 Scope of work

- (1) Promote linkage of payment systems among ASEAN and some Asian countries.
- (2) Coordinate a revision and amendment of regulations that are conducive to international payment transfer.
- (3) Establish minimum requirements for linkage of international payment systems.

2.5.8.3 Goals

- (1) Establish linkage of retail payment systems among ASEAN and some Asian countries.
- (2) Establish supporting regulations and criteria for international payment.

2.5.9 Implementation plan for payment system development to support trade and investment between Thailand and neighboring countries

2.5.9.1 Expected outcome

Guidelines for payment systems development, which related to trade and investment promotion, between Thailand and neighboring countries, including promote payment and exchange money from unorganized sectors to the formal financial system.

2.5.9.2 Scope of work

- (1) Survey problems and obstacles of payment systems that impact to trade and investment, between Thailand and neighboring countries.
- (2) Study and recommend guidelines for payment systems development which support trade and investment, between Thailand and neighboring countries, including promote payment and exchange money from unorganized sectors to the formal financial system.

- (3) Cooperate with government and private sectors, including the central banks in neighboring countries to establish guidelines of efficient of payment systems, which is benefit of trade and investment between Thailand and neighboring countries.

2.5.9.3 Goals

Payment systems support trade and investment between Thailand and neighboring countries

3. Summaries of implementation plans, responsible agencies and timeframes

<p>Plan 1 Promotion of attractive electronic payment systems for “consumer” users.</p>	
<p>Expected outcome:</p> <p>Establishment of electronic payment services as alternatives to cash payment through the development of electronic payment systems that comply with the needs of different consumer groups. The systems should be able to provide equitable services for all consumers, especially in terms of service fees, accessibility, and efficiency.</p>	
<p>Scope of Work:</p> <ol style="list-style-type: none"> (1) Conduct studies on incentives and obstacles to electronic payment service usage. (2) Improve the popularity of different electronic payment systems such as debit cards, electronic money and the SMART debit system. (3) Provide more options for nationwide equitable electronic payment services for consumers such as making payment through mobile phone, Internet, ATM machines, bank branches and pay points. (4) Conduct feasibility studies on local switching of domestic credit card/ debit card and electronic money services to reduce operation costs for payment providers and stores; and on the development of PIN (Personal Identification Number) based debit card services to improve safety in goods and services purchase. (5) Study and instigate for the establishment of common electronic payment standards and electronic payments interoperability. 	<p>Responsible agencies:</p> <ol style="list-style-type: none"> (1) Bank of Thailand (2) The Thai Bankers’ Association (3) The Foreign Banks’ Association (4) The Board of Trade of Thailand (5) National Electronics and Computer Technology Center (NECTEC) (6) The Thailand Development Research Institute (TDRI) (7) Service providers of e-money

Plan 2	
Promotion of attractive electronic payment systems to “business” users	
Expected outcome: An increase in electronic payment services as alternatives to cash and cheque payments among private operators and government agencies.	
Scope of work:	Responsible agencies:
<ul style="list-style-type: none"> (1) Conduct studies on problems and obstacles to electronic payment service usage (2) Liaise with government agencies and relating agencies to promote electronic funds transfer (3) Promote admissibility of electronic payment documents such as electronic receipts and electronic international payment documents as legal evidence. (4) Study and promote establishment of common electronic payment standards to support government and private agency transactions. 	<ul style="list-style-type: none"> (1) Bank of Thailand (2) The Thai Bankers' Association (3) The Foreign Banks' Association (4) The Board of Trade of Thailand (5) National Electronics and Computer Technology Center (NECTEC) (6) Related governmental agencies

Plan 3	
Study and revision of payment costs and service fees	
Expected outcome: Fair and proper calculation of electronic payment service fees for all user groups. Promote more electronic payment usage.	
Scope of work:	Responsible agencies:
<ul style="list-style-type: none"> (1) Study the cost of providing various payment services, including the cash handling cost (2) Study the Fair Cost Model for the network connection between Large and small banks. (3) Recommend guidelines for suitable payment fees for different payment services. (4) Conduct public hearing of related stakeholders (5) Encourage the implementation of appropriate pricing structure 	<ul style="list-style-type: none"> (1) Bank of Thailand (2) The Thai Bankers' Association (3) The Foreign Banks' Association (4) The Board of Trade of Thailand (5) The Thailand Development Research Institute (TDRI)

Plan 4	
Establishment of standards and guidelines for observance of local and international laws and regulations	
Expected outcome	
Establishment of standards or guidelines for electronic payment providers that comply with applicable local and international laws and regulations, to provide safe and stable electronic payment services without placing unnecessary burden on payment providers.	
Scope of work:	Responsible agencies:
<ul style="list-style-type: none"> (1) Conduct implementation guidelines under relevant laws and regulations and notifications related to electronic payments and also gather problems, obstacles and limitations for implementation including compliance costs (2) Formulate suitable standard and implementation guideline for payment service providers in order to reduce burdens under regulations, criteria and notifications. (3) Liaise with other departments in BOT and other related oversight agencies to solicit opinions from them. 	<ul style="list-style-type: none"> (1) Bank of Thailand (2) The Thai Bankers' Association (3) The Foreign Banks' Association (4) National Electronics and Computer Technology Center (NECTEC)

Plan 5	
Improvement of payment system oversight efficiency	
Expected outcome	
Establishment of oversight measures for electronic payment systems and payment providers that comply with international standards and are acceptable to payment providers. Implementation of applicable laws to ensure efficient, safe and stable payment systems that will generate confidence among users and safeguard financial system and financial institution stability.	
Scope of work:	Responsible agencies:
<ul style="list-style-type: none"> (1) Initiate legislation of electronic payment service oversight laws. (2) Issue notifications and criteria that comply with international standards. Arrange public hearings to solicit opinions from payment providers and concerned parties. (3) Oversee electronic payment providers' observance of relevant laws, notifications and criteria. (4) Liaise with local and international agencies to promote various collaborative efforts to benefit electronic payment systems and electronic payment providers oversight. (5) Publicize BOT's oversight roles to concerned parties. 	<ul style="list-style-type: none"> (1) Bank of Thailand (2) Electronic Transactions Commission

Plan 6	
The BAHTNET risk management	
Expected outcome	
Establishment of risk monitoring and management measures to ensure smooth payment under the BAHTNET system in order to increase public confidence in the financial system and financial institutions.	
Scope of work:	Responsible agencies:
<ul style="list-style-type: none"> (1) Prepare risk management guidelines to ensure smooth operation under the BAHTNET system in order to promote efficient liquidity management for financial institutions. (2) Coordinate and prepare for legislation of payment system laws to support payment finality in the BAHTNET system and multilateral netting. 	<ul style="list-style-type: none"> (1) Bank of Thailand (2) Commercial banks

Plan 7	
Preparation for cross-border linkage of the BAHTNET payment system	
Expected outcome	
Establish clear directions for a Payment Versus Payment (PvP) based cross-border linkage of the BAHTNET payment system that comply with standard market practices of financial institutions worldwide, in order to reduce foreign settlement risks to local financial institutions and BOT.	
Scope of work:	Responsible agencies:
<ul style="list-style-type: none"> (1) Analyze benefits and impacts of payment systems linkage. (2) Consult local payment service users and concerned parties. (3) Liaise with other central banks for consultations and collection of detailed information. (4) Formulate suitable payment systems linkage guidelines for Thailand and prepare for legal readiness for applicable regulations, operations, and technologies. (5) Formulate operation plans for cross-border linkage of the BAHTNET system. 	<ul style="list-style-type: none"> (1) Bank of Thailand (2) Commercial banks

Plan 8	
Establishment of linkage of retail payment systems among ASEAN and some Asian countries	
Expected outcome Establishment of efficient and low-cost linkage of retail payment systems among ASEAN and some Asian countries to provide more payment options and promote transfer of payment from unorganized sectors to the formal financial system.	
Scope of work: (1) Promote linkage of payment systems among ASEAN and some Asian countries. (2) Coordinate a revision and amendment of regulations that are conducive to international payment transfer. (3) Establish minimum requirements for linkage of international payment systems.	Responsible agencies: (1) Bank of Thailand (2) Commercial banks (3) Steering committee (4) Technical committee (5) System operators

Plan 9	
Develop payment system to support trade and investment between Thailand and neighboring countries	
Expected outcome Guidelines for payment systems development, which related to trade and investment promotion, between Thailand and neighboring countries, including promote payment and exchange money from unorganized sectors to the formal financial system.	
Scope of work: (1) Survey problems and obstacles of payment systems that impact to trade and investment, between Thailand and neighboring countries. (2) Study and recommend guidelines for payment systems development which support trade and investment, between Thailand and neighboring countries, including promote payment and exchange money from unorganized sectors to the formal financial system. (3) Cooperate with government and private sectors, including the central banks in neighboring countries to establish guidelines of efficient of payment systems, which is benefit of trade and investment between Thailand and neighboring countries.	Responsible agencies: (1) Bank of Thailand (2) The Thai Bankers' Association (3) The Board of Trade of Thailand

