

Lao People's Democratic Republic

Bank of the Lao P.D.R.

**Preparatory Survey on
a blockchain based modern payment
infrastructure project in Lao People's
Democratic Republic
(Private Sector Investment Finance)**

Final Report

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SORAMITSU CO., LTD.

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Abbreviations

Abbreviation	Official name
ACH	Automated Clearing House
AFP	Access to Finance for the Poor
AML	Anti-Money Laundering
BCEL	Banque pour le Commerce Extérieur Lao public
BIS	Bank for International Settlement
BOL	Bank of the Lao P.D.R.
BoLNet	Bank of the Lao P.D.R. Network
CBDC	Central Bank Digital Currency
CCH	Cheque Clearing House
CFT	Combating the Financing of Terrorism
CIC	Credit Information Center
CODI	Community Organizations Development Institute
CSD	Central Securities Depository
DC	Data Center
DT-MFI	Deposit Taking-Micro Finance
EMI	Euphratean Microfinance Institution
FIAM	Foundation for Integrated Agricultural and Environment Management
GDP	Gross Domestic Product
GIZ	Deutschemark Gesellschaft für Internationals. Zusammenarbeit
ICT	Information Communication Technology
IT	Information Technology
JCM	Joint Crediting Mechanism
JICA	Japan International Cooperation Agency
KYC	Know Your Customer
LAK	Lao Kip
LaPASS	Lao Payment and Settlement System
LAPS	Lao ATM Pool Switching
LDB	Lao Development Bank
LSX	Lao Securities Exchange
LWU	Lao Women's Union
MOF	Ministry of Finance
MOU	Memorandum of Understanding

NDT-MFI	Non-Deposit Taking-Micro Finance
NEDO	New Energy and Industrial Technology Development Organization
NFT	Non-Fungible Token
NPL	Non-Performing Loan
NSO	Network Support Organization
PoC	Proof of Concept
PSIF	Private Sector Investment Finance
PSPs	Payment Service Providers
RTGS	Real Time Gross Settlement
SCU	Savings and Credit Unions
SIPS	Systematic Important Payment Systems
STP	Straight Through Processing
VB	Village Bank
VSG	Village Savings Group

Chapter 1. Project Overview

1.1. Project Overview

The bank account ownership ratio of the Lao People's Democratic Republic (hereinafter referred to as "Lao PDR") is low at 26.8%, however mobile communications, including smartphones, are becoming more widespread. In urban areas, financial institutions are offering new payment methods such as mobile payments. To promote interconnectivity among financial institutions, financial inclusion within Lao PDR, and to economic revitalization, the objective of this project is to establish a blockchain based payment infrastructure for the Bank of the Lao P.D.R. (BOL)

In this Preparatory Survey on a blockchain based payment infrastructure, the survey team will investigate the country's financial legal system, licenses for payment service providers, status of interbank payment system, capability of financial institutions, payment practices in major urban areas of Lao PDR, and issues with the payment system for transfers among financial institutions. The survey will identify issues to be considered for the establishment and operation of a blockchain based payment infrastructure in Lao PDR.

In addition, in order to identify issues related to financial inclusion, the survey team will conduct a survey on the status of bank account ownership and the use of the local currency, the Lao Kip, in Lao PDR. Furthermore, the team will conduct a survey on the mobile penetration ratio focusing on smart phones, which are the basic infrastructure, and the penetration of cashless services by payment service providers in Lao PDR.

Since SORAMITSU does not have a local base in Lao PDR, it will need to establish a local company to operate and maintain the blockchain based payment system if there is a feasibility for development. In addition, SORAMITSU expects local financial institutions, IT vendors, and other local private companies to invest and participate in the project.

Project finance in the form of Private sector investment finance provided by JICA will be utilized to ensure stable operation of the business. In addition, the survey team aims to consider and promote system connections with various systems regarding financial market and inter-system connections with other countries with an awareness of connectivity within ASEAN.

1.1.1. Project objectives

The purpose of this Preparatory Survey is to conduct a broad survey of the actual situation of the financial system in Lao PDR, to identify the effects of introducing a blockchain based payment system in Lao PDR, as well as issues in the financial system and in practice, and to investigate and present concrete proposals for dealing with these issues.

Furthermore, the survey team will discuss the direction of the business model with the department in charge of the Bank of Lao PDR, its supervisory authority, and relevant ministries

such as the Ministry of Post and Telecommunication, with the aim of obtaining confirmation of the prospects for business operation, including the possibility of a payment system using blockchain and the profitability of the business.

1.1.2. Sites visited

Main cities in Lao PDR

(Vientiane, Luang Phabang, Savannakhet, Pakse)

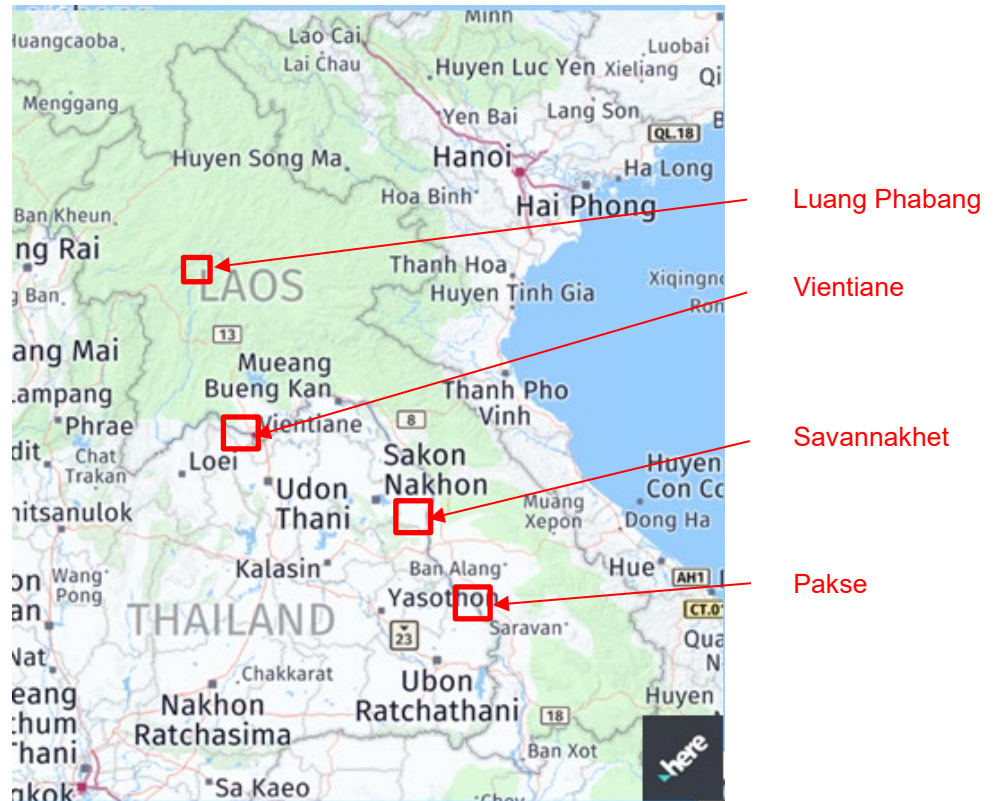


Figure 1 Sites visited

Source:Wego here (PL1702¹)

1.1.3. Interview survey

The main interview targets are as follows. The survey team aims to conduct interviews for the smooth implementation of this project by selecting interview targets according to each task.

¹ PL1702 is the license number for Wego here

Table 1 Main interview targets

Interview target	Content
Ministry of Finance	Explanation of project, status of capital market development, assistance from other countries, requests for digitalization, etc.
Bank of the Lao P.D.R.	Explanation of project, financial system, financial system infrastructure, status and needs of settlement system, etc. Regular meetings are expected.
Other ministries (Ministry of Post and Telecommunication, Ministry of Science and Technology)	Explanation of the project, ICT infrastructure (network), licenses and approvals for payment and settlement companies, etc.
Lao Banker's Association	Explanation of the Project, role of banking associations, status of interbank settlement systems, status of KYC at each financial institution, etc.
Banque Pour Le Commerce Extérieur Lao (BCEL)	Explanation of the project, financial infrastructure, branch network payment methods, etc.
Other financial institutions (including microfinance institutions)	Explanation of the project, financial infrastructure, branch network, payment methods, etc.
Payment service providers and IT vendors	Explanation of the project, payment methods, customer base, etc.
Retailer	Survey of settlement usage

Source) Survey team

1.2. Survey organization and schedule

This survey will be performed by SORAMITSU CO., LTD., Mitsubishi Research Institute and External Personnel. Details are shown in the next section.

1.2.1. Survey organization

The table below shows the personnel involved and their roles.

Table 2 Person engaged and their roles

Affiliation	Name	Role
SORAMITSU	Kazumasa Miyazawa	Project director/ Project feasibility survey1
Individual contract (External personnel)	Taketoshi Mori	Financial system survey/Project feasibility survey2
Mitsubishi Research Institute, Inc. (External personnel)	Takayuki Himeno	Financial system infrastructure survey/Municipal Financial System Survey1
Mitsubishi Research Institute, Inc. (External personnel)	Kazuma Okazaki	Municipal Financial System Survey2

Source) Survey team

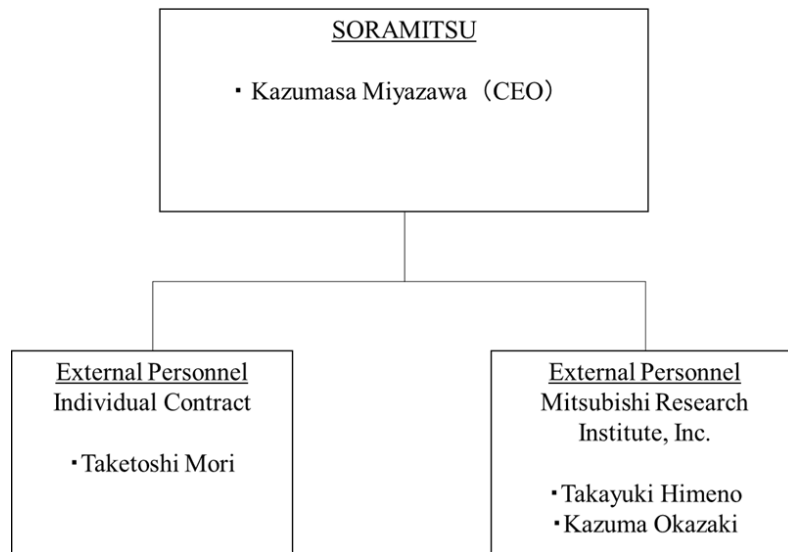









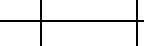




Figure 2 Survey implementation structure

Source) Survey team

1.2.2. Survey schedule

The survey schedule is described below.

Table 3 Survey schedule

Main work	2021	2022								
	12	1	2	3	4	5	6	7	8	
Domestic work (Preparation)	 									
1. First Domestic work		 								
2. First field survey (Lao PDR)					 					
3. Second domestic survey						 				
4. Second field survey (Lao PDR)							 			
5. Third domestic survey								 		
Report submission		▲IC/R			▲IT/R			▲DF/R		F/R▲

(Report) IC/R : Inception report, IT/R : Interim report, DFR : Draft final report, FR : Final report

 Plan (Domestic survey)  Plan (field survey)  Actual

Source) Survey team

1.3. Basic Information

1.3.1. Basic statistical data

Basic information on Lao PDR is shown below.

Table 4 Basic statistical data

Items	Description
Population	7.314 million (2021)
Area	236,800 km ²
Capital City	Vientiane (Population: Approx. 969,000)
Ethnic groups	Officially 50 ethnic groups including Lao
Official language	Lao
Religion	Buddhism
Currency	Lao Kip (LAK)
Political system	People's democratic republic system, Unicameral system (164 members) President : Thongloun Sisoulith Prime minister : Phankham Viphavanh
GDP	LAK 182.603 trillion
National budget	Annual revenue LAK 31.593trillion

Items	Description
Inflation rate	0.8%(2017)、2.04%(2018)、3.28%(2019)、5.07%(2020)、3.75%(2021)

Source) Survey team based on the interview from JETRO local office

Of the country's population of seven million, 27% live in urban areas (one-third live in the capital Vientiane, and two-thirds live in large rural cities), while the remaining 73% live in rural areas, including mountainous areas. In 2018, 99.5% of the population of urban areas had access to electricity and 97% of rural areas, while mobile phone penetration in 2019 was only 60%. There are still some poor districts in mountain and rural areas, and the penetration of mobile phones in these areas is estimated to be even lower than in urban areas².

In terms of industrial structure, the service sector is dominant, accounting for about 42% of GDP. This is followed by industry at 32% and agriculture at 15%. Nominal GDP is about USD 18.9 billion, and GDP growth rate was 5.5% in 2019³. However, the growth rate has slowed in recent years due to the Covid-19 epidemic, and the real GDP growth rate is expected to be 2.1% in 2021 and 3% in 2022⁴.

In terms of financial inclusion, Lao PDR remains at a low level, with 29.1% of the population aged 15 and above holding bank accounts (22.4% in rural areas), 0.6% holding credit cards, and 12.7% holding debit cards. The percentage of digital payment users is 13.3% in total and 9.2% in rural areas, suggesting that diffusion in the country as a whole is still in its infancy⁵.

In December 2021, a rail service called the China-Laos Railway was launched. This railroad extends 1,035 km from Kunming Station in China to Vientiane Station, with a journey time of 10 hours, and is used for both cargo and passenger transport⁶. This railroad is an important land transportation hub for ASEAN countries and is attracting even more attention with the completion of a cargo transshipment facility between China-Laos Railways and the State Railways of Thailand on July 7, 2022⁷. Exports from Laos via this railroad mainly include potassium salt and natural rubber, while daily commodities, agricultural products, chemicals, and machinery are imported from China⁸

1.4. Central Bank Digital Currency (CBDC)

The Central Bank Digital Currency (CBDC) covered by this project is said to satisfy the

² Institute for International Monetary Affairs, <https://www.fsa.go.jp/common/about/research/20210423/report.pdf>, 2022/02/15

³ Ministry of Foreign Affairs, <https://www.mofa.go.jp/mofaj/area/laos/data.html>, 2022/02/15

⁴ BOL, https://www.bol.gov.la/en/fileupload/24-12-2021_1640313060.pdf, 2022/02/15

⁵ Institute for International Monetary Affairs, <https://www.iima.or.jp/docs/newsletter/2021/nl2021.19.pdf>, 2022/02/24

⁶ JETRO, <https://www.jetro.go.jp/biznews/2021/12/a445618a89a2c609.html>, 2022/07/29

⁷ JETRO, <https://www.jetro.go.jp/biznews/2022/07/b6c0933252709c25.html>, 2022/07/29

⁸ 2022/07/13 JETRO Lao office interview

following three conditions. (1) it must be digitized; (2) it must be denominated in an existing unit of account; and (3) it must be issued as an obligation of the central bank. Generally, the central bank provides banknotes as a means of payment and settlement that anyone can use 24 hours a day, 365 days a year, and a central bank digital currency will be issued by digitizing them. In Lao PDR, e-money provided by telecommunication service providers and QR payments provided by major banks are already being offered. The table below shows differences between these means of payment and CBDC.

Table 5 Differences between CBDC and e-money⁹

Items	CBDC	e-money
Versatility	Can be used everywhere	Depending on store.
Disreputability	Can be passed on to anyone without limiting the scope	Limited between specific stores and users
Finality	Have a Finality	Payment instructions only; separate bank-to-bank account transfers required

Source) Survey team based on PRI,MOF(2022)

At the same time, there are discussions on whether new information technology can be used to make central bank obligations, which are already digitized in the form of central bank current accounts, more convenient. Many major central banks are engaged in research studies and demonstration experiments with a view to gaining a deeper understanding of new information technologies. Bank of Japan, in collaboration with the European Central Bank, is conducting a study (Project Stella) on a new information technology called distributed ledger technology¹⁰. In this survey, three different design patterns for CBDC ledgers are being considered, and an overview is shown in the figure below.

⁹ Policy Research Institute, <https://www.mof.go.jp/pri/research/seminar/fy2021/lm20220329.pdf>, 2022/08/25

¹⁰ Bank of Japan, https://www.boj.or.jp/announcements/release_2020/data/rel200212a1.pdf, 2022/08/25

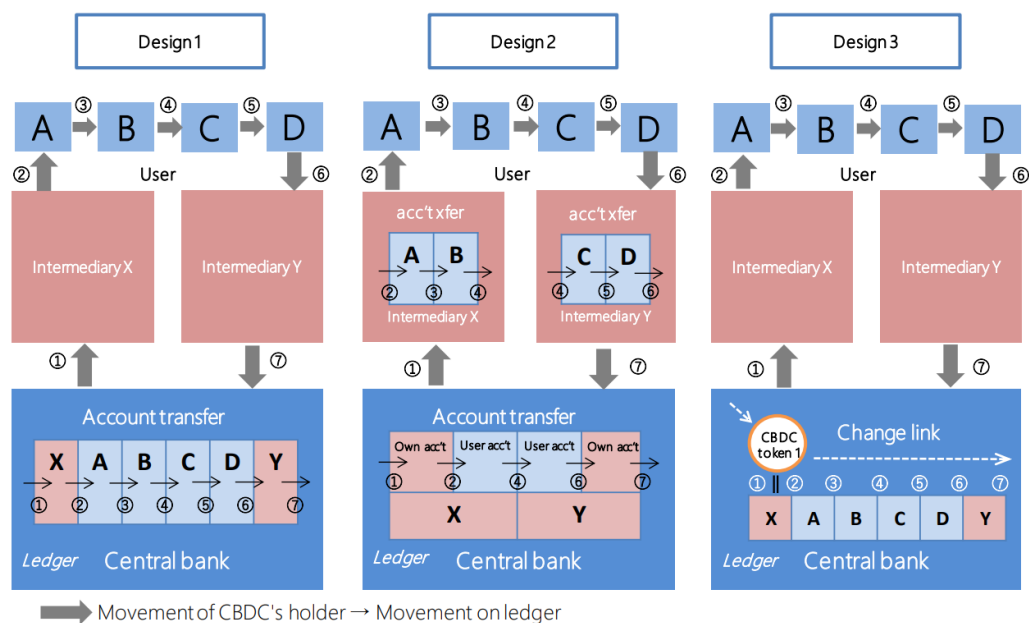


Figure 3 Design pattern of CBDC ledger¹¹

Source) Results and Findings from “Proof of Concept Phase 1”

Of the three design alternatives for CBDC ledgers, Designs 1 and 2 recognize the CBDC’s holding status as an intermediary’s or end user’s account balance, in an account based CBDC ledger system (Figure 3). Of these, Design 1 is a method by which the central bank manages a ledger that records the balances of all intermediaries and end-user accounts. Design 2, on the other hand, is a method by which the central bank manages a ledger that records the account balances of intermediaries (own accounts/user accounts in aggregate), and the intermediaries each manage ledgers that record the account balances of their respective customer users. Finally, Design 3 assigns unique IDs to monetary data representing a fixed value, and the CBDC’s holding status is indicated by linking those IDs to user IDs, in what is called a token-based CBDC ledger system. An overview of each design pattern is shown in the table below.

Table 6 Description of design pattern¹²

#	Items	Design 1	Design 2	Design 3
1	Management entity	Central bank	Central bank/Intermediary	Central bank
2	Token assignment	No	No	Yes

¹¹ Bank of Japan, https://www.boj.or.jp/en/announcements/release_2022/rel220526a.pdf, 2022/08/25

¹² Bank of Japan, https://www.boj.or.jp/en/announcements/release_2022/rel220526a.pdf, 2022/08/25

#	Items	Design 1	Design 2	Design 3
3	Record scope and management roles	Central bank manages ledgers that record balances and transactions of all users and intermediaries	An intermediary manages a ledger that records the balance and transactions of its customers. The central bank manages a ledger that records balances and transactions for each intermediary institution.	Central bank manages a ledger that records the movements of all token's numbers.
4	Transfer CBDC	Fund transfer between users' accounts	Transfer by fund transfer between users account (transfer across intermediaries increases or decreases the account balance of both the intermediary and the user)	Transfer by changing association between token numbers. and user ID
5	Main challenge	The central bank handles the burden of processing all transactions and concentrating various functions on the system managed.	Range of freedom in designing individual ledgers of intermediaries An information linkage system between intermediaries is required to confirm the remittance destination account.	It may take time to update the database of transaction depending on the number of tokens issued and the method.
6	Pros	It is efficient and safe, because one ledger covers all transactions. IT workload and performance are acceptable as a base.	It is preferable that system should not operate 7/24 because the balance of each ledger should be checked at the end of the day.	It is easy to find case of fraud or theft with a token number. It is almost same idea as bank note management.
7	Cons	Nothing special except to defining the role and scope of intermediary.	Structure is complicated and the central bank and intermediary closely communicate. It is a burden for the intermediary to control own and users' account, etc.	Tokens are managed on each face amount basis, and transaction volume increase and IT workload may be heavy. It is necessary to exchange money and process a transaction, etc.

Source) Results and Findings from "Proof of Concept Phase 1"

In order to operate CBDC, the Central Bank Law or Law on payment system would need to provide that the central bank can issue currency by means other than cash, which would require

legal development.

In addition to legal arrangements, it is necessary to consider handling in the central bank account and consistency with other legal systems such as personal information and AML/CFT.

Chapter 2. Business Feasibility

2.1. Project Implementation Plan

2.1.1. Business scope ▪ Business objective

① Project scope

Table 7 Project scope and objectives

Item	Content
Project scope	Development of a blockchain based payment infrastructure. The system will be developed based on a foundation implementing Hyperledger Iroha of SORAMITSU, which utilizes blockchain technology, and SORAMITSU will seek the possibility of establishing a local company to manage local operations and maintenance of the system, contributing to the development of financial markets in Lao PDR.
Project objectives	The bank account ownership ratio in Lao PDR is 26% ¹³ , and there is a need to expand access to financial services in order to achieve economic growth and strengthen social systems such as cash benefits. In addition, Lao PDR is dependent on neighboring countries for trade, and since the Thai baht and US dollar are also in circulation in the country, it is necessary to increase settlements in the local currency. With the spread of smartphones, mobile payments (QR payments) are becoming popular, and there is a need to strengthen the payment system through efforts towards standardization. In order to address these issues, the project aims to improve the overall efficiency of payment operations in Lao PDR, achieve financial inclusion of the unbanked population, promote the use of local currency payments, and contribute to the modernization of the payment infrastructure as well as financial markets in Lao PDR.
Related organizations	BOL, Ministry of Finance of Lao PDR, Ministry of Technology and Communication, financial institutions, and payment service providers in Lao PDR
Beneficiaries	Direct beneficiaries: Bank of the Lao P.D.R. Indirect beneficiaries: Commercial banks (state-owned banks and private banks), users of payment systems

Source) Survey Team

An overview of the system to be provided is shown in the figure below. The system will be connected to the central bank's existing payment platform (assumed to be an instant payment system, retail point-of-sale payment system, etc.) through an Application Programming Interface (API), and to the core banking system of the financial institutions in compliance with ISO 20022 international standards. By connecting to the core banking systems of financial institutions that comply with the international standards of ISO 20022, SORAMITSU will be able to greatly simplify and reduce the cost of the entire national payment architecture. SORAMITSU is implementing a similar system in Cambodia. Cambodia has a remittance market, including domestic remittances from urban centers to rural areas and remittances of migrant income from neighboring countries. Although cash deposit and withdrawal outlets are increasing in a wide range of areas, such as rural areas, the financial authorities were aware of the problem of not going through banks and central bank. "Bakong," the blockchain based payment system introduced in Cambodia, has the following features:

1. A token-type digital currency that has the same value as cash and can be circulated from place to place;

¹³ World Bank, Global Findex Database 2017

2. Strong security and sufficient processing capacity, operated by the National Bank of Cambodia, for all 16 million individuals, companies, and financial institutions.
3. Secure, easy, and fast payment and remittance of local currency and US dollars.
4. Users can send money directly to the recipient's cell phone number without knowing the recipient's bank account number, and users also can perform money transfer and payment by scanning QR codes.
5. Blockchain can be used for everything from retail payments to high-value interbank transactions consistently, greatly simplifying and lowering the cost of the payment architecture in the whole country.
6. Utilization of Hyperledger IROHA, which is a blockchain developed by SORAMITSU in Japan.
7. Partnership with Maybank in Malaysia for easy and low-cost cross-border remittances.

SORAMITSU would like to introduce this sophisticated system to Lao PDR, as well through this feasibility survey. The following is an image of the system architecture.

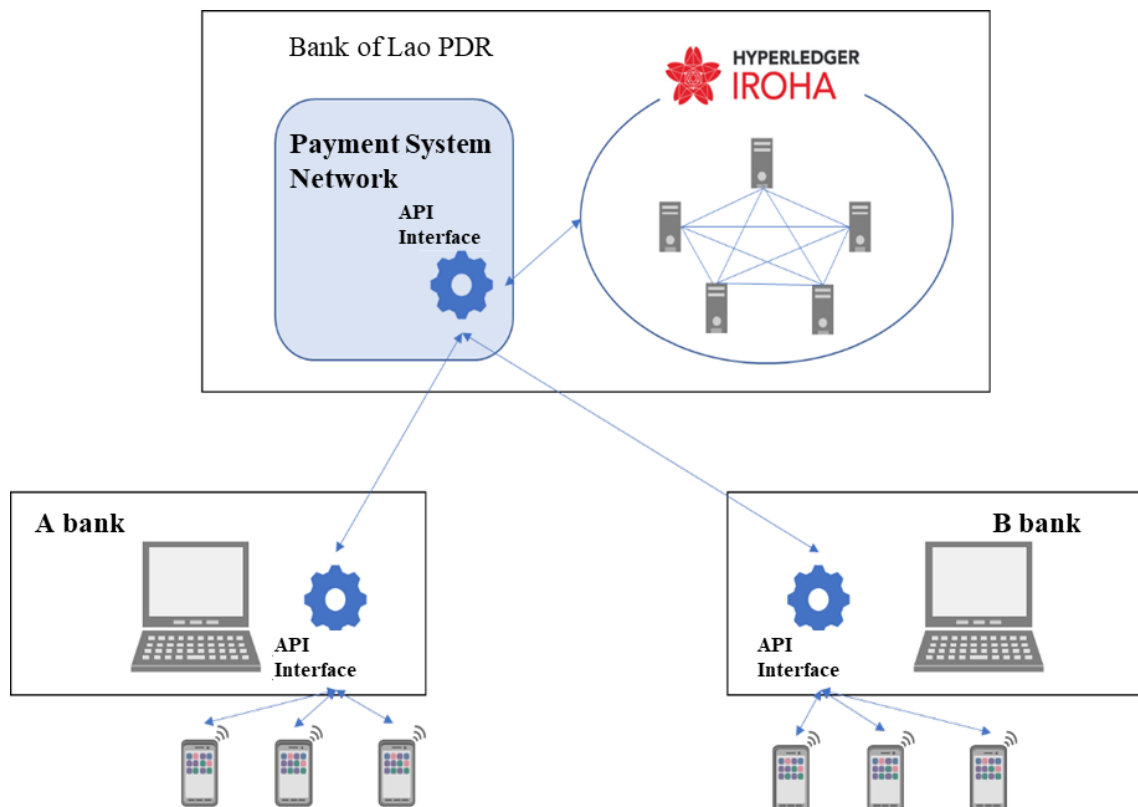


Figure 4 Image of system architecture

Source) SORAMITSU

The system developed in Cambodia (Bakong) can accept both US dollars and Cambodian riel for payments and settlements, based on the actual situation in the country. The National Bank of Cambodia determines the exchange rate between the Cambodian riel and the US dollar. In Cambodia, both the local currency, the riel, and the US dollar are in circulation, but the US dollar is dominant and is used by tourists and in stores. It is said that about 70% of the total amount of currency in circulation in the country is in US dollars. From the perspective of strengthening the local currency, the National Bank of Cambodia is trying to promote use of the local currency by issuing a policy that at least 10% of its loan portfolio should be denominated in Cambodian riel. On the other hand, since the ratio of US dollars in circulation in the market is high, it is necessary to promote use of the local currency gradually rather than rapidly. In this regard, Bakong introduced by SORAMITSU is contributing to the circulation of local currency. Since the launch of Bakong, Riel-denominated issuance has accounted for 60% of the total amount.

In Cambodia, SORAMITSU proposed an indirect issuance model that emphasizes cooperation with private financial institutions.

Table 8 Classification of central bank digital currency issuance forms

	Direct issuance from central bank	Indirect issuance from private bank
Account type (Similar to deposit) Necessary to transfer cash	Model1 Heavy workload for central banks in terms of identity verification, account management, etc. Reduction of private banks' business	Model3 Private banks' business systems for identity verification and account management are complex.
Token type (Similar to currency) Unnecessary to transfer cash	Model2 Reduction in the workload of private banks, including central bank identity verification and account management.	<u>Model4 (Adopted in Cambodia)</u> Identity verification, account management, and other operations are simple using the business systems of private banks (the same form of distribution as cash).

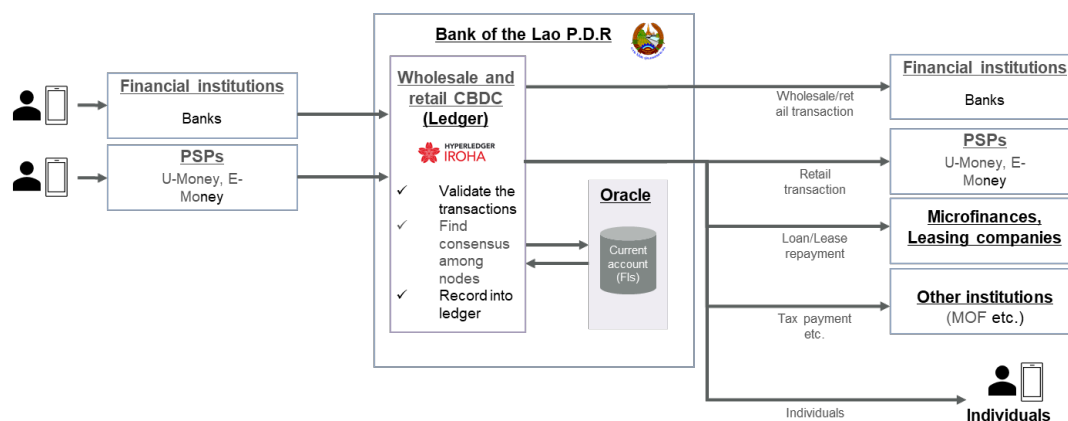
Source) Mitsubishi Research Institute based on Institute for Monetary and Economic Studies, Bank of Japan

In Cambodia, the system incorporates measures for AML (Anti Money Laundering), privacy, and re-issuance upon identification in case of the loss of a cell phone, etc., to ensure convenience for users and to enable the financial authorities to properly supervise the system as a payment system.

2.2. System introduction

2.2.1. System Overview Diagram

Assumed outline of proposed system is as follows.



Source) Survey Team

Figure 5 System overview diagram

The system owner is assumed to be BOL. Participants are expected to include financial institutions, payment service providers, microfinance, leasing companies, other government ministries, and individual users. The system is expected to have functions such as checking transactions between banks, building consensus algorithms among nodes, and filling in ledgers.

Target functions are expected to include gross settlement between financial institutions, remittances between financial institutions and payment service providers, and remittances between individuals. In addition, the system will be applicable for use cases such as payment of utility bills since other ministries will participate in the system.

In addition, since Lao PDR is promoting standardization of QR codes, it is envisioned that Bakong functions such as e-KYC will be implemented to use this system as a foundation for common QR code payments in the future.

Since the central bank digital currency needs to be linked to a checking account, it needs to be linked to the existing payment system LaPASS in order to increase or decrease checking account concurrently with CBDC transactions as well as an account system such as Oracle. LAPNet will coexist after the launch of system, but it may be possible to link the ATM system with digital currency (LAK) deposits and withdrawals, and this system will be linked to and integrated with this system in the future.

The system configuration is assumed to consist of servers distributed at two locations.

2.2.2. Advantages of system introduction

① Simplified and faster payment flow

Prior to introducing the system, funds could not be transferred in real time when a payment was made using electronic money, and funds were transferred through multiple bank accounts. Therefore, it took approximately one month from the time a user made a payment until the time

the store received it. However, with the introduction of the system, funds are transferred in real-time via CBDC, enabling immediate payment, which is expected to simplify payment flow and speed up the payment process.

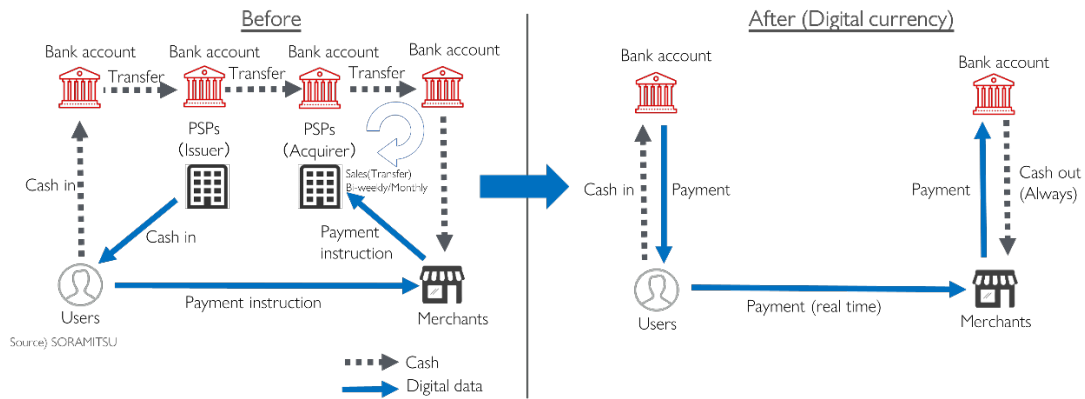


Figure 6 Payment flow before/after implementation

Source) Survey team

② Enhancing convenience by standardizing payment method

In Lao PDR, many banks provide QR code payment services, and a variety of QR codes are used in many retail stores. Therefore, by introducing the system and standardizing the QR Code, the use of QR Codes based on standard specifications on a single payment system will contribute to improving user convenience. Using standard specifications is also expected to reduce QR Code management costs for commercial banks.

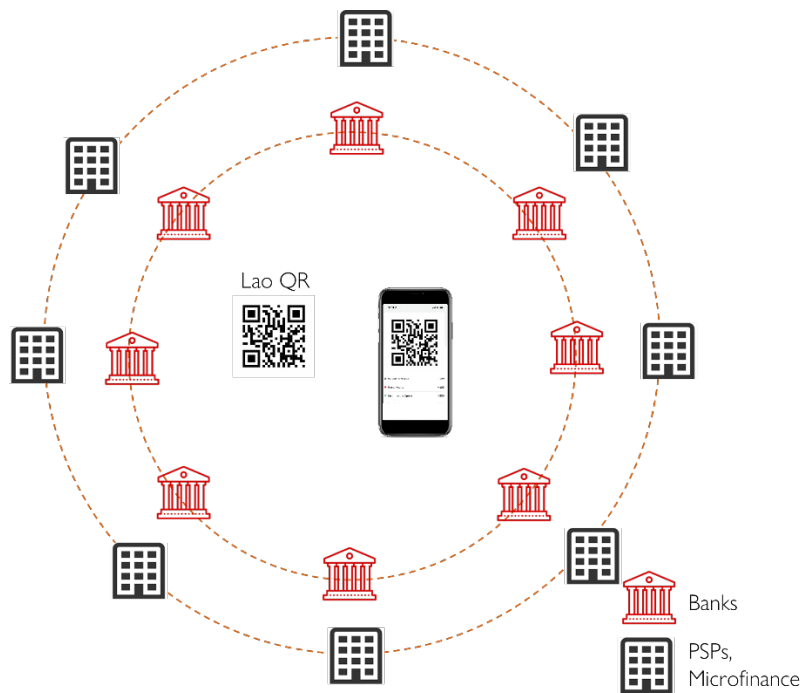


Figure 7 Image of standardization

Source) Survey team

③ Reducing cost of connecting each participant

Prior to introducing the system, fund transfers between banks and fund transfer companies required separate API connections, making development costs an issue. Introducing this system as a settlement platform eliminates the need for individual connections and allows easy fund transfers between participants as long as they are connected to the platform.

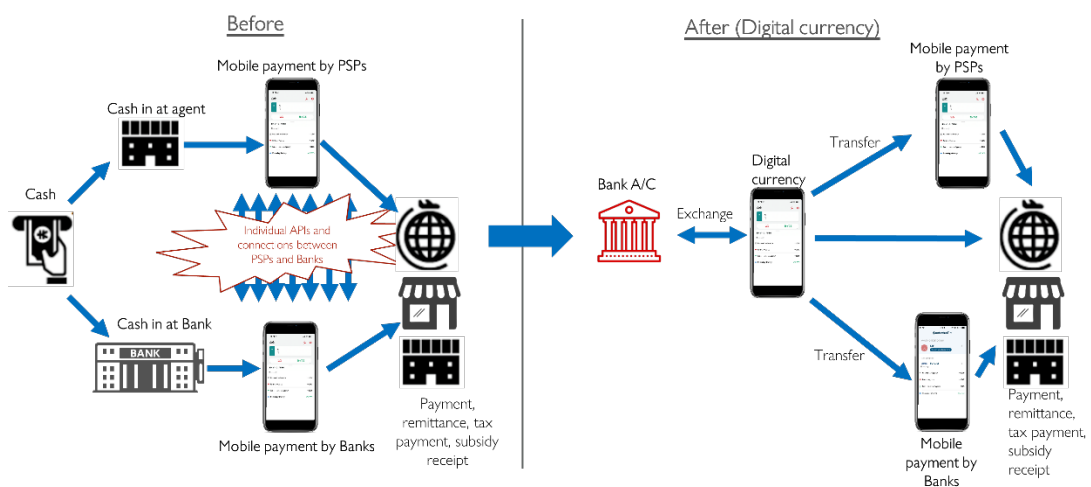


Figure 8 Cost reductions after implementation

Source) Survey team

④ Faster cross-border payment at lower cost

There is strong demand for migrant remittances among ASEAN countries. Currently, SWIFT remittances are the main method, but remittance speed and cost are not sufficient. Therefore, after introducing this system, real time cross-border remittances are expected to be realized at low cost. As mentioned earlier, Cambodia has already implemented cross-border remittances via the CBDC system.

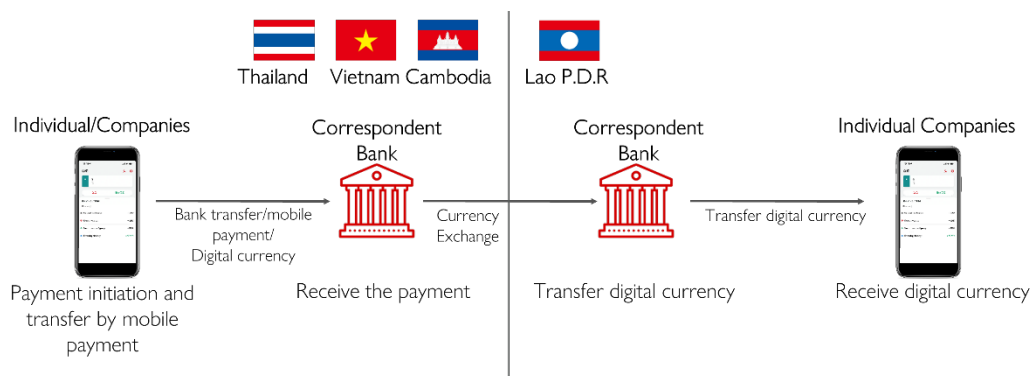


Figure 9 Image of cross-border remittance

Source) Survey team

Chapter 3. Financial Legal System Survey

3.1. Overall strategy

3.1.1. Goals and outline of the overall strategy

The BOL has announced that it will develop a payment system and payment services that can be used both domestically and internationally to promote digital economic development, cooperate with monetary strategies, maintain financial stability, and provide convenient and modern services to the Lao people at safe and affordable prices. The overall direction of the project is to (1) reduce the use of cheques and cash; (2) create a digital payment ecosystem and promote digital payments; (3) increase the number of payment channels to payment systems outside of the country; (4) secure innovation in payment operations; (5) use payment system information for policy regulations and policy management (such as monetary policy) through research. The following five elements are listed. The following development goals are set out in the report¹⁴.

Table 9 Development goals¹⁵

#	Contents
1	Management and development of a sound payment system and a high level of human resource development
2	Reform of the basic structure -Important payment systems, retail payment systems -Cross-border payment systems with many payments channels -Cyber security -Establishment of an information sharing platform
3	Encourage innovation and the participation of various financial service providers, including commercial banks and non-bank sector financial institutions
4	Improve the government's revenue and expenditure management system and connect it with the banking system by 2025
5	Financial education and consumer protection for governments, businesses, or citizens who are users of payment or financial services

Source) Survey team, based on data from BOL

3.1.2. Development of payment systems

The history of the payment system in Lao PDR is shown below.

¹⁴ BOL, Payment System Development Strategy (2021-2025)

¹⁵ BOL, Payment System Development Strategy (2021-2025)

Table 10 Development of payment systems

Year	Contents
1995	Started development of payroll system.
1995-2000	Migrated information to computers and began recording financial status certificates and customer information into the core banking system, primarily for use in banking services.
2000-2005	Established the Credit Information Center (CIC) to create basic information on customer-related information and bank accounts. Aggregation of financial status certificates among some of the banks connected to the then BoLNet (Bank of the Lao P.D.R. Network).
2005-2010	Interconnection of computer systems and facilities among commercial banks for easy management; BOL reporting system, ATM services, POS information, etc. were connected by high-speed cables between commercial banks and BOL.
2011	Started using RTGS. (USD 10 million ¹⁶)
2010-2015	Interbank connectivity begun.
2015	Launched Lao ATM Pool Switching (LAPS) through joint use of bank cards. Bank transfer service via cell phones started.
2017	Notification for use of payment system issued (No. 32/NA, 17/11/2017).
2018	Payment system management bureau established in BOL.
2019-2020	Regulatory aspects: Some of the provisions of the Payment Systems Law were applied. Detailed regulations are as follows. (i) Agreement on Systematic Important Payment Systems (SIPS) No.: 29/BOL Date: 1/14/2019 (2) Agreement on Retail Payment System No.: 293/BOL Date: 4/1/2019 (iii) Agreement on Payment Service No.: 288/BOL Date: 2020/3/17 (iv) Agreement on Lao QR Payment Standard No.: 74/BOL Date: 2020/1/28 5) Agreement on Lao Payment and Settlement System No: 327/BOL Date: 2020/5/26 Development: 2019 Started to provide payment service between Lao Suu Thai using QR Code; started to create standards for QR Code and standardize payment using QR Code; improved LaPASS functionality and started to modify it to comply with ISO 20022; scheduled to be completed in 2023 ¹⁷ .

Source) Survey team. with reference to Payment System Development Strategy

The BOL defines and manages three systems as Systematic Important Payment Systems (SIPS): 1) RTGS, 2) ACH, and 3) CCH. These systems are operated via LaPASS. RTGS has been in operation since 2011 and is currently being upgraded to comply with ISO 20022. ACH can be used for cheque payments, card payments, and stock payments.

ACH is used for low value payment settled at a designated time in a day and transactions of card payment and stock payments are conducted by RTGS of LaPASS.

3.1.3. Activities to enhance payment systems by 2025

The BOL will implement the following initiatives to realize the payment system strategy.

① Improvement of payment system management system and management rules

Develop human resources with the knowledge and ability to respond to actual work and positions. In particular, focus on human resource development for the management and supervision of system administrators and payment service providers, including consumer protection.

Focus on developing human resources to manage and supervise system administrators and payment service providers.

Administrative rules should be created under the law, and the basis and standards for

¹⁶ World Bank, <https://documents1.worldbank.org/curated/ar/551701468091771833/pdf/699110REVISED00ay020120Update0Final.pdf>, 2022/03/02

¹⁷ 2022/01/20, AIF Group Interview

administration should be defined. In particular, the BOL will consider a tracking and management mechanism that ensures speed and transparency, and also aim to use a Regulatory Sandbox for establishing a tracking and management system and reporting methods based on the standards and rules and aim for centralized and efficient reporting by system administrators and payment service providers. In addition, system administrators themselves should be able to easily collect reporting information and analyze and report opportunities for improvement, risk potential, and payment system operation status.

② Enhancement of system administrators and promoting sharing

To improve, develop, and promote the basic structure of the Important Payment System and the Retail Payment System to comply with international standards, and to operate them domestically and internationally. To encourage payment service providers to share the basic structure of payment systems in a centralized and systematic manner, avoiding unnecessary development and costs incurred by each provider.

③ Promoting diversity of service providers

Encourage competition among payment services that are fair, transparent, and auditable, and promote the diversification of commercial banks, non-bank financial institutions, and corporations (Fintech) that offer convenient, fast, advanced, and low-cost payment services.

④ Training of service users

Encourage users of payment services and users of financial services to use such services, while receiving financial education and consumer protection from the government, enterprises, or the public. Consumer protection mainly includes the ability to appeal to the relevant authorities. It will also promote an increase in the number of payment service users, financial users and information sharing.

⑤ Enhancement of cyber security

Review rules and mechanisms among relevant agencies. Mainly, the Ministry of Information Technology will study the security block center and the mechanism to solve emergency problems in the computer system, and the Information and Communication Team will study the Lao Computer Emergency Response Team. Reviewing the security of the payment system country wide to ensure the security of system administrators and domestic and international payment service providers.

⑥ Improvement of the revenue and expenditure environment

Regarding the payment system for revenue and expenditure management, the payment system of each payment service provider is currently not being used according to its actual payment capacity.

Therefore, it is necessary to introduce a digital payment system as shown in the figure below so that government revenue and expenditure management can be efficient and responsive to the

times.

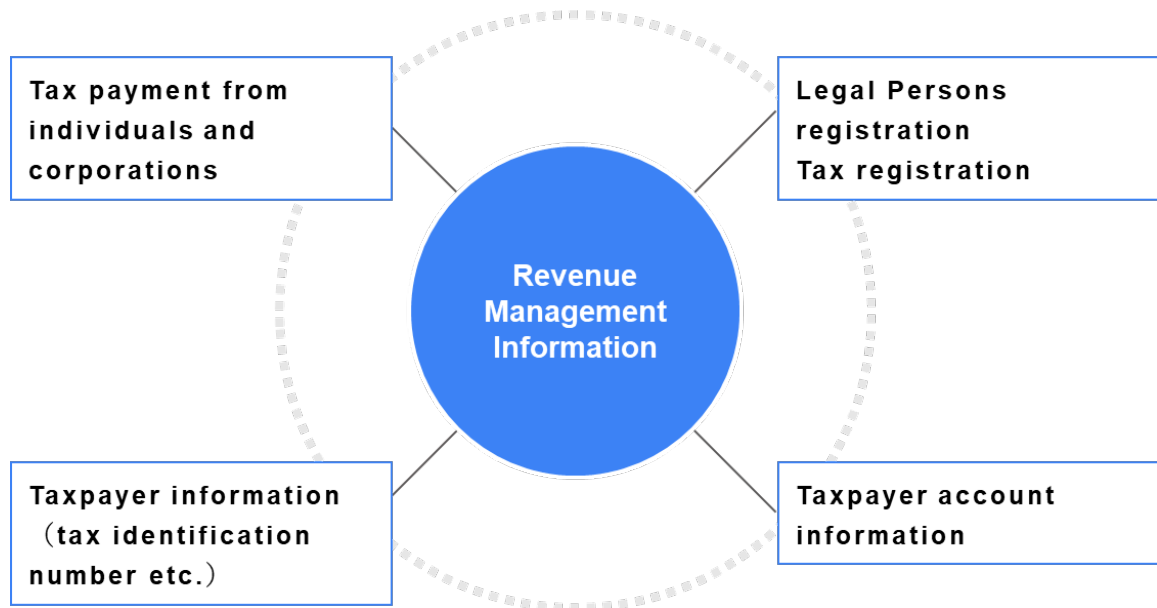


Figure 10 Image of a digital payment system for revenue management

Source) Survey team, from BOL, Development Strategy for Payment Systems

Specifically, the taxpayer information collection system should be improved to allow shared use of ID numbers, Family Book and Passport numbers, and tax registration numbers for corporations. Taxes from individuals and corporations will be able to be matched with data on taxpayer information from various related organizations to enable the calculation of amounts. In addition, the collection of taxes from corporations will be linked to the operation of bank accounts.

⑦ Connection of payment systems

The system will connect easy tax¹⁸ and BOL's LaPASS as Straight Through Processing(STP) to handle the government's revenue and expenditure operations. Focus on centralization and provide taxpayer information directly to commercial banks and payment service providers via the Tax Revenue Information System (TaxRIS), so that taxpayers can pay their taxes conveniently, simply and accurately. The specific plan is shown in the figure below.

¹⁸ It is a system for making tax payments through banks that went live in 2015, with the participation of Lao Development Bank (LDB) and Banque pour le Commerce Extérieur Lao Public (BCEL), among others.

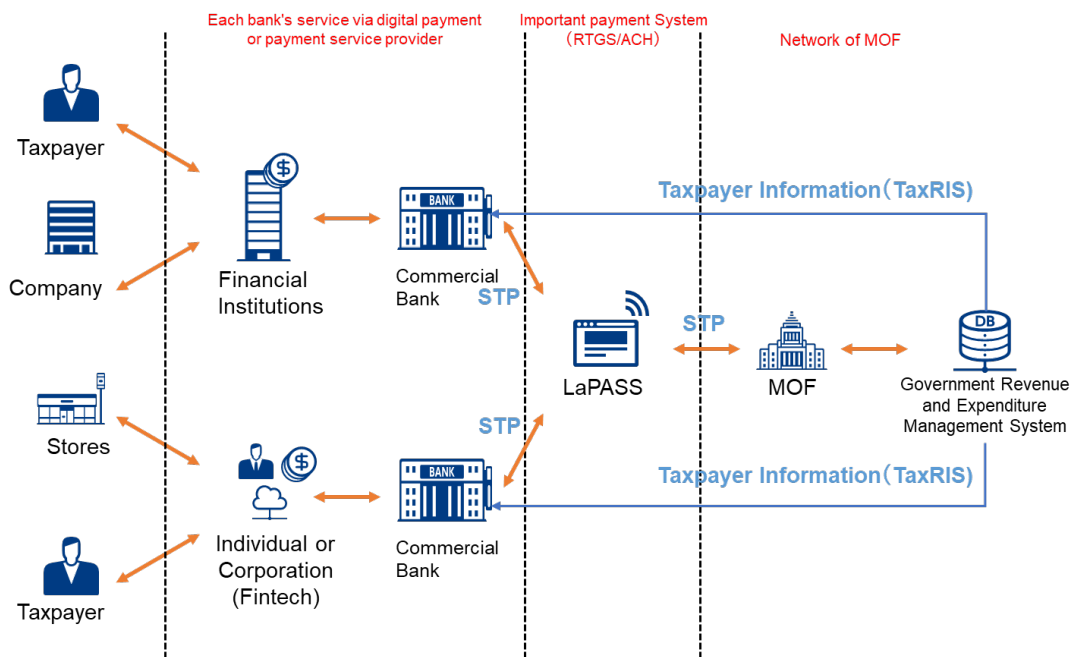


Figure 11 Direction of connection between revenue settlement system and LaPASS

Source) Survey team, from BOL, Development Strategy for Payment Systems

3.1.4. Stakeholder roles in upgrading payment systems toward 2025

The table below shows a list of related organizations and their roles in work related to the payment system strategy.

Table 11 List of government agencies involved in the payment system strategy

#	Institution	Role
1	Ministry of Finance	<ol style="list-style-type: none"> 1) Prescribe policies that allow corporations to use accounting systems along with accounting books to control and audit corporate income and expenditures consistent with actual business activities. 2) Prescribe tariffs, taxes, and various fees according to the actual situation of each organization. 3) Calculate tariffs and taxes and input corporate activities and corporate information from the Ministry of Commerce into the system.
2	Bank of the Lao P.D.R. (BOL)	<ol style="list-style-type: none"> 1) Improve development of payment system into a modern, convenient and secure system, and minimize the use of cash by sharing each payment system. 2) Unify the payment system so that all payment service providers (commercial banks, financial institutions, and corporations) can use a single system. 3) Centralize management of accounting systems throughout the country. 4) Ensure that each payment system manager and payment service provider comply with policies and regulations of each institution.

#	Institution	Role
3	Payment system operator	1) Develop equipment to enable payment service providers to handle the government's budget management tasks. 2) The Retail Payment System aggregates payments and clear them with the centralized system, the budget account to which the BOL has subscribed.
4	Payment service provider	1) Develop equipment to enable payment service providers to handle a wide variety of budget operations using digital payments, based on the policies and regulations of each BOL agency. 2) Guarantee budget payments to be settled with the BOL's subscribed budget accounts via a centralized system.
5	Ministry of Industry and Commerce	Provide the following information via API. 1) Registration information 2) Import and export information of enterprises
6	Ministry of Public Security	Provide the following information via API Enterprise information (ID, family book, passport)
7	Ministry of Technology and Communications	1) Provide basic information and secure means of information reporting for subscribers to the revenue collection and budget management system. 2) Register phone numbers in all systems. 3) Implement policies to reduce the cost of Internet services.

Source) Survey team, from BOL, Development Strategy for Payment Systems

Regarding the private sector, some large enterprises will be selected to create an example of a model for connecting payment systems with payment service providers and to encourage small and medium-sized enterprises to subscribe to the service side of electronic payments. It will also improve the quality of the products of domestic and foreign government enterprises, and small and medium-sized private enterprises to meet the standards (product type/grade), facilitate access to domestic and foreign online markets, and enhance the added value of the products. It will also improve the E-Commerce business environment related to low-cost, fast, and convenient payment services. In addition, it will encourage E-Commerce businesses to shift their payments from cash to system use, and improve local businesses' access to financial services, such as financial services on cell phones and electronic payments¹⁹.

3.2. Overview of Financial Regulations

3.2.1. Relevant legislation

The laws and regulations governing financial institutions are listed in the table below according to the BOL website²⁰.

¹⁹ BOL, Payment System Development Strategy (2021-2025)

²⁰ BOL, <https://www.bol.gov.la/en/law>, 2022/02/10

Table 12 Related laws

#	Name	Content
1	Law on the Bank of the Lao People's Democratic Republic (Enacted in 1995 and amended in 2018)	It defines principles, rules, etc. regarding the organization, operation and role of BOL to ensure its efficiency and operability.
2	Law on Payment System (Enacted in 2017)	It defines principles, rules, etc. to ensure accessibility, safety, and transparency in payment system supervision.
3	Law on Foreign Exchange Management (Enacted in 2014)	It defines principles and rules, etc., for the management and supervision of foreign exchange operations and transactions in foreign currencies, with the aim of ensuring the stability of the Lao Kip, promoting the circulation of domestic money, and expanding cooperation with other countries.
4	Law on Anti-Money Laundering and Counter-Financing of Terrorism (Enacted in 2014)	It defines principles and rules for the effective control and supervision of money laundering and terrorist financing with the aim of preventing, controlling and eliminating such activities.

Source) Survey team, from the BOL Web site

3.2.2. Licenses, related notifications and manuals for payment/Fintech businesses

Relevant licenses, regulations, guidelines, etc. are listed in the table below.

Table 13 Related regulations and guidelines etc.

#	Name	Year/Month
1	Strategic Plan for Payment Systems Development 5 Years (2021-2025)	2021/5 (Approved)
2	The Payment Systems Oversight Framework	2021/4 (Approved)
3	Law on Payment Systems No.32/NA	2021/11
4	Decision on Systemically Important Payment System No.29/BOL	2019/1
5	Decision on Lao Payment and Settlement System No.327/BOL	2020/5
6	Decision on Retail Payment Systems No.293/BOL	2019/4
7	Decision on Payment Service Providers No.288/BOL	2020/3
8	Decision on Lao QR for Payment No.74/BOL	2020/1
9	Guideline on Application for Revision, Changing Permission for Payment System Operator, Payment Service Provider, Development and New Payment Product No. 648/PSD	2020/8
10	Guideline on Card Payment Service Provision No.422/PSD	2021/5
11	Guideline on Electronic Money Service No.666/PSD	2021/8
12	Guideline on Agent of Payment Service No.1088/PSD	2021/12
13	Guideline on Bill Payment Service No.022/PSD	2022/1
14	Guideline on Reporting of Payment System Operators and Payment Service Providers No.077/PSD	2022/1

Source) Survey team, based on a questionnaire survey of BOL.

BOL is currently reviewing a draft amendment to the Law on Payment System for consideration by the National Assembly in 2022²¹.

In addition, according to the current Law on Payment System, Payment System Operators, Payment Service Providers and Users are defined as follows.

²¹ 2021/12/27, BOL interview

Table 14 Definitions in Payment Law²²

#	Name	Definition
1	Payment System Operator	It refers to the entity responsible for clearing and settlement in the payment system. The BOL is an operator of the RTGS and is also the clearing system operator for government bonds. The Central Securities Depository (CSD) is the clearing and settlement system operator for stocks and on-board securities.
2	Payment Service Providers	The BOL or commercial banks, or legal entities licensed by the BOL, are entities that provide payment systems directly to users by connecting to their own payment systems or other payment systems. The BOL is the only RTGS service provider. In addition, commercial banks and corporations including microfinance, CSD and securities companies are service providers for retail payment systems and securities trading.
3	Users	This term refers to entities that conduct transactions through payment service providers, including individuals, corporations, and domestic and foreign organizations. The BOL, Ministry of Finance, commercial banks and securities clearing houses are the users of RTGS. Financial institutions and other organizations that play an important role in the fiscal and financial sectors need to be licensed by the BOL. Commercial banks, financial institutions, individuals, corporations, and other organizations are users of the retail payment system. Private and institutional investors are the users of securities settlement system services.

Source) Survey team based on Law on payment system (2017)

BOL recommended that crypto assets are not a legally usable currency or means of payment and settlement in Lao PDR and are not under the control of the authorities, and that risks should be considered for investment and trading (Central Bank Recommendation No. 314 (August 29, 2018) on the use and investment of crypto assets)²³. However, in September 2021, BOL reversed its policy and crypto asset trading will be allowed in 2022. BOL is currently implementing its regulation.

3.3.Relevant Ministries

3.3.1. Ministry of Finance (MOF)

The Ministry of Finance, established in 1947, is an organization that is primarily empowered to formulate, execute, and manage the budget. Its main roles are to ensure sound finances, achieve fair taxation, maintain reliability of the currency, and ensure stability of foreign exchange. Specifically, it is responsible for establishing expenditure allocation standards and accounting standards, taking the lead in budget preparation, integrating budget plans, managing budget execution, preparing supplementary budget proposals, preparing final accounting reports, and borrowing according to budget execution status²⁴.

In its overall strategy for upgrading the payment and settlement system, the Ministry of Finance is working to improve the revenue and expenditure environment, which is related to the payment

²² BOL, <https://www.bol.gov.la/en/law>, 2022/02/22

²³ JETRO, https://www.jetro.go.jp/world/asia/la/trade_05.html, 2022/06/27

²⁴ JICA, https://www.jica.go.jp/laos/office/information/report/ku57pq00002ua457-att/chapter_02.pdf, 2022/06/22

and settlement system in terms of defining policies to enable control and audit of corporate income and expenditures, and defining tariffs, taxes, and various fees in accordance with the situation of each government agency. In particular, the revenue and expenditure systems are closely related to the payment system, and several systems are in operation and under development. The table below shows the revenue and expenditure systems currently in operation and under development.

Table 15 Overview of revenue and expenditure system²⁵

#	Name	Category	Description
1	Asycuda	Revenue	It was established with the support of the United Nations and is managed by the Customs and Excise Department of the Ministry of Finance. It provides services related to electronic procedures required for customs clearance at border checkpoints nationwide.
2	Lao National Single Window	Revenue	Developed by the Ministry of Finance and BIVAC Lao sole Co.,Ltd. on January 15, 2019, the Ministry of Finance Decision No. 204 on Approval for the Use of the Lao National Single Window in the Importation of Vehicles via the First Friendship Bridge on the Lao-Thai Border was issued. The use of the Lao National Single Window (LNSW) was officially approved ²⁶ .
3	TaxRIS	Revenue	The system became operational in 2017 with a loan from South Korea. It is operated by the tax department as a tax collection system.
4	GFIS	Expenditure	It was developed in 2000 with support from the World Bank and is currently being updated. Functions include trade execution, cash management, and reporting functions.

Source) Survey team, based on interviews with BOL.

Regarding tax collection, the Ministry of Finance holds revenue accounts at five banks (BCEL, LDB, Lao Vietnam, JDB, and APB), and taxes are deposited there. For Asycuda, taxes are collected through BCEL's Easy-tax application. However, while the system allows tax collection outside of the Lao Kip, Easy-tax is only compatible with the Lao Kip, which has been pointed out as a challenge²⁷. In order to integrate the collection of such taxes and revenue as a whole, the Ministry of Finance is currently implementing a system called FinLink, which is being developed in collaboration with AIF Group, BCEL, and HUAWAI, with the objectives of centralizing the decentralized management of revenue and building an identification infrastructure using tax IDs. Regarding the schedule, design will be completed by June 2022, tested by September 2022, and a trial of the system is expected to start from October 2022. Regarding connection with LaPASS which is a payment and settlement system infrastructure, the Ministry of Finance is still discussing it with BOL.

²⁵ 2022/4/28 MOF Interview

²⁶ JETRO, https://www.jetro.go.jp/world/asia/la/trade_05.html, 2022/6/13

²⁷ 2022/4/28/ MOF Interview

3.3.2. Ministry of Technology and Communications (MTC)

With the dismantling in 2021 of the Ministry of Science and Technology, which was established in 2013, the Ministry of Posts and Telecommunications was renamed the Ministry of Technology and Telecommunications, and it became the main ministry in charge of telecommunications projects²⁸. The former National Post and Telecommunications Agency was separated from the former Ministry of Communications, Transport, Post and Construction (MCTPC) in October 2007 as an organization responsible for postal, telecommunications, and information and communication technology, and was newly established in September 2011 as the Ministry of Post and Telecommunications.

The Ministry of Posts and Telecommunications is in charge of policy making, licensing, market supervision and management, frequency allocation, import and export management of telecommunications equipment, and universal service fund management in the telecommunications sector^{29 30}, the Ministry of Technology and Communications is currently responsible for technical studies in the fields of technology, innovation, telecommunications, Internet and cyber security³¹. The Ministry of Technology and Communications Ministerial Agreement No. 888 (dated November 9, 2021³²) on the Pilot Project of Digital Assets Business stipulates that the mining project shall have a power purchase contract for 10 MW or more, the electricity rate shall be 6.95 cents/kWh, and mined Crypto assets must be bought and sold on an exchange in Lao PDR. A 15% tax will be levied on trading on the exchanges³³.

The interview in this project covered the Department of Digital Technology, which is technologically relevant to blockchain and digital IDs. This organization has 51 officials in total and is divided into the following departments: (1) Administration, (2) Legislation, (3) Policy, (4) Digital Economy, (5) Digital ID, (6) Data Center supported by NEDO (New Energy and Industrial Technology Development Organization), and (7) Blockchain Research. (5) Digital ID covers Digital ID System, E-Resident, E-Finance, E-Health, E-School, E-Government, etc. Since the signing of an MOU with the Phousy Group in January 2022, a study committee has been established within the Department and is currently studying the issue³⁴. In addition, (7) blockchain research has only six staff members. Due to budget constraints, human resource development and training have not been adequately conducted. Regarding the scope of application of blockchain,

²⁸ ONE ASIA LAWYERS, <https://oneasia.legal/8447>, 2022/06/22

²⁹ TrueConf, <https://trueconf.com/blog/wp-content/uploads/2021/08/ministry-of-technology-and-communications.pdf>, 2022/06/22

³⁰ Ministry of Internal Affairs and Communications, https://www.soumu.go.jp/g-ict/country/lao/pdf_contents.html, 2022/06/22

³¹ MTC, Charuda Luanglath, <https://cicc.or.jp/japanese/wp-content/uploads/211209-04la.pdf>, 2022/06/22

³² JETRO, https://www.jetro.go.jp/world/asia/la/trade_05.html, 2022/06/27

³³ JETRO, https://www.jetro.go.jp/world/asia/la/trade_04.html, 2022/06/21

³⁴ Phousy Group(2022.3), <https://www.pcdlao.com/2022/03/10/phousy-group-company-signs-a-pilot-agreement-to-conduct-digital-asset-transactions/>, 2022/6/13

they are interested in use cases in the tourism and public sectors, NFT, bank payments, and Digital ID³⁵.

3.4. Bank of the Lao P.D.R.

3.4.1. Relevant department

The roles of the Payment System Department and Information Technology Department, which are particularly relevant to the implementation of payment systems, are shown in the table below. In addition, there is the Banking Operation Department, which is in charge of the settlement status of the system and responding to banks. In addition, a CBDC Research Team has been formed within the bank to conduct research on digital currencies at BOL³⁶.

The IT department, with 44 employees, is responsible for the operation of hardware and software for all internal and external information systems, including LaPASS (see below).

Table 16 List of divisions of payment system department

Name	Role	Number of staff
Payment System Policy Division	<ul style="list-style-type: none"> • Research and formulate policies and development strategies for payment systems • Issuing and coordinating rules and regulations for payment systems • Issuing licenses for payment system operators and payment system businesses • Coordinating international cooperation on payment system development 	6
Payment System Development Division	<ul style="list-style-type: none"> • Research on payment system development (e.g., retail payments and cross-border payments) • Research on technological innovation and standards related to payments (FinTech, regulatory sandbox, etc.) • Research on security and standardization of payment systems 	8
Payment Oversight Division	<ul style="list-style-type: none"> • Off-site monitoring and on-site inspection of payment service providers • Risk assessment of payment service providers • Data collection from payment service providers • Dealing with unlicensed payment service providers • Assistance for smooth business promotion of payment service providers 	6

Source) Survey team, based on a questionnaire survey of BOL.

³⁵ 2022/4/28 MTC Interview

³⁶ 2022/4/25 BOL Interview

Table 17 List of divisions of information technology department

Name	Role	Number of people
Information and Maintenance Division	• Data management and IT planning	8
Program Development Division	• System analysis and application development	15
IT Infrastructure Management Division	• Infrastructure management and operation	14
Electronical Payment Division	• Payment system support	7

Source) Survey team, based on a questionnaire survey of BOL.

3.4.2. Branches

The table below provides an overview of Luang Prabang and Pakse where the survey was conducted. The systems used in the table are basically operated by the headquarters of BOL, and the branches are positioned as one user of the system managed by the headquarters.

Table 18 Overview of BOL branches^{37 38}

	Luang Prabang	Pakse	Savannakhet
Region of Business	Luang Prabang, Sainyabuli	Champasak, Salavan, Sekong, Attapeu	Savannakhet, Bolikhamsai, Khammuon
Number of employees (IT staff)	62(2)	81(3)	77(1)
Number of departments	7 (General Affairs Department (including IT staff), Commercial Bank Management, Microfinance Management, Currency Management, Inspections, Accounting, Cash Vault Management)	7 (Admin department, internal audit, economic and foreign currency management, bank supervision, microfinance supervision, cash vault management)	7 (Admin department, internal audit, economic and foreign currency management, bank supervision, microfinance supervision, cash vault management)
Systems in use	• Core Banking System	• Core banking system • MISB (to compiles information reported by the bank) • HR management System	• Core banking system • MISB (to compiles information reported by the bank) • HR management System
Number of registered Microfinance bodies	15	27	28
Usage Ratio of Lao Kip in Payment System	77.20% (USD 11.4%, THB 11.4%)	Approx. 60%	Unknown

Source) Survey team, based on Interviews with BOL branches.

As indicated in the above table, promoting the use of the Lao Kip, which is used during settlement, is a challenge in these regions. In particular, foreign currencies are often used at the borders of Vietnam and Thailand, and the use of USD is prevalent. In southern areas such as Pakse,

³⁷ 2022/5/9/BOL Luang Prabang Branch Interview

³⁸ 2022/5/12/BOL Champasak Branch Interview

trade along the border between neighboring countries are the major source of transactions, but BOL branch mentioned that transactions are conducted using foreign currencies without going through banks, and regulation and supervision of this is a challenge. The branch aims to promote the use of local currency by explaining foreign currency regulations and laws governing foreign currency management with respect to the local currency.

In addition, microfinance registration is conducted in accordance with BOL regulations, and the application and approval process is handled by each branch. BOL branch highlighted that supervision of microfinance in Pakse is carried out by one of the most soundly managed microfinance institutions in the country, and the ratio of non-performing loans (NPLs) is on a downward trend at 11%.

Also, financial inclusion is a challenge in the rural areas. In terms of bank service development, although there is a need for ATMs to be installed in rural areas, banks are promoting the use of mobile applications due to the administrative costs involved. As a result, while mobile payments have penetrated urban centers, financial services are not widespread in rural areas due to the challenges of Internet access and other communication environments^{39 40}.

In addition, city banks can open checking accounts at their branches, which are different from checking accounts at the head office. As a result, interbank transactions between city banks that do not own checking accounts at the central bank are cleared at the branch, which differs from the Japanese checking account system (in Japan, the city banks have a single checking account at the central bank) Although the head office of the central bank is promoting the use of LaPASS, a lack of training, and transaction commission fees have been challenges and have not promoted the use of LaPASS⁴¹ has not been promoted.

³⁹ 2022/5/9 BOL Luang Prabang Branch Interview

⁴⁰ 2022/5/12 BOL Champasak Branch Interview

⁴¹ 2022/7/11 BOL Savannakhet Branch Interview

Chapter 4. Financial Infrastructure System Survey

4.1. Overview of financial system

4.1.1. Interbank payment system status

LaPASS is an interbank payment system equipped with RTGS and ACH functions (see Section 4.2 for details). LAPNet, a payment system for switching ATM/credit card/mobile payments, is also widely used (see Section 4.3 for detailed information on the connection status with each commercial bank).

The table below shows the ISO 20022 compliance status of major banks.

Table 19 ISO20022 implementation status

Banks	Status (○ : adopted, × : not adopted)
BANQUE POUR LE COMMERCE EXTERIEUR LAO PUBLIC	○
Lao Development Bank	× (Plan to connect with RTGS within 2022)
MARUHAN Japan Bank Lao Co.,ltd	○
KASIKORNTHAI BANK Limited	× (Connect via SWIFT)
SAIGON THUONG TIN BANK LAO Sole CO.,LTD	○
ACLEDA BANK LAO.,LTD	×
INDOCHINA BANK LTD	× (MT message, Web-based use in terms of return on investment)

Source) Survey team, based on Interviews with major banks.

4.1.2. ICT Infrastructure status including networks and data centers

As of January 2021, there were approximately 5.8 million cell phone users, accounting for 79.1% of the total population, and approximately 3.55 million Internet users, accounting for 48.4% of the total population. This means that cell phones and the Internet are spreading rapidly⁴². However, compared to neighboring Thailand, the GSMA score for network coverage in Thailand is 85.5, while in Lao PDR it is only 78.3, suggesting that there are issues in Internet penetration in rural areas⁴³. (GSMA scores represent the average of the percentage of the population that has access to 2G, 3G, 4G, and 5G networks, respectively.)

Regarding data centers, Lao DC IT, GDMS (Global Digital Management Solutions), and R2C are doing their business^{44 45}.

In particular, the data center operated by R2C is one of the major data centers in Lao PDR, as it has the capability to collect official and important documents. The data center offered by R2C is a Tier 3 (simultaneous maintenance DC) which includes all of the features of Tier 1 + Tier 2 + dual power equipment and multiple uplinks and has multiple power and cooling paths⁴⁶.

⁴² Kepios, <https://datareportal.com/reports/digital-2021-laos>, 2022/06/22

⁴³ GSMA, <https://www.mobileconnectivityindex.com/#year=2021&zoneIsocode=LAO&analysisView=LAO>, 2022/06/22

⁴⁴ Lao DC, <https://laodc.com/>, 2022/06/24

⁴⁵ GDMS, <https://www.global-dms.com/iaas/>, 2022/06/24

⁴⁶ R2C, <https://www.r2c.co.th/data-center/>, 2022/6/27

In addition, the energy-efficient data center has been demonstrated and operational since 2016 under the leadership of the Ministry of Technology and Communications. The project is supported by Japan's NEDO and includes the calculation of greenhouse gas emissions (through JCM bilateral crediting system⁴⁷). The data center has redundant fiber rings and power supplies with multiple upstream providers, and it is equipped with an emergency diesel generator. In addition, a solar power plant has been installed to reduce environmental impacts.

Note that the Ministry of Technology and Communications is not responsible for the development of the entire government's data center, but rather a part of it, and has also built an external data center. In addition, the commercial data centers are collaborating with global companies, and the global companies are promoting their services to users at their contact points⁴⁸.

4.2.LaPASS

4.2.1. Overview

RTGS had been in operation since 2011, but due to technical changes related to payments and the fact that it was not compliant with ISO 20022, additional development was done in 2019 to make it ISO 20022 compliant. On June 1, 2020, it was officially launched under the name Lao Payment and Settlement System ("LaPASS")⁴⁹. LaPASS is based on CMA small systems package software, Modifications made in 2019 to comply with ISO 20022 took about two years and cost USD 200,000. As a platform, it has the functions of RTGS and ACH⁵⁰. LaPASS is managed by three departments: (1) Banking Operation Department is responsible for the payment status of the system and communication with banks, (2) Payment System Department is responsible for payment management (mainly in terms of regulations), (3) Information Technology Department is responsible for overall management and operations. Currently, there are 2,500 transactions per a day in average⁵¹.

There are two types of cheques: BOL-issued cheques and bank-issued cheques. Prior to the implementation of LaPASS, banks cleared cheques manually at BOL branches, but the process has changed since LaPASS was implemented. If the drawer of an issued cheque pays by cheque, the payee must bring the cheque to the issuing bank branch and the cheque is supposed to be cleared by LaPASS⁵².

The challenges of LaPASS include a lack of integration with the stock exchange system and interbank currency trading systems, the fact that many financial institutions do not connect to LaPASS via STP (only eight of 39 participating banks have STP connections), and the lack of

⁴⁷ NEDO, https://www.nedo.go.jp/news/press/AA5_100681.html, 2022/5/1

⁴⁸ 2022/4/28 MTC Interview

⁴⁹ BOL, Payment System Development Strategy (2021-2025)

⁵⁰ BOL, https://www.bol.gov.la/en/fileupload/13-07-2020_1594608779.pdf, 2022/02/17

⁵¹ Responses from BOL to the Questionnaire

⁵² 2022/5/12 BOL Champasak Branch Interview

connectivity to interbank settlement and the government's revenue and expenditure systems^{53 54}. In addition, BCEL recognized that when LaPASS fails, there is no communication or notification from BOL in the event of a settlement failure, so it is necessary to communicate with related banks, which requires time-consuming responses by LaPASS^{55 56}. BOL has expressed interest in cross-border connections and connections with non-banks and other entities to contribute to financial inclusion⁵⁷.

4.2.2. Participants

Participants of LaPASS can be divided into four categories as follows, but currently no microfinance providers and payment service providers are participating in LaPASS. MOF is considering the use of LaPASS for obtaining money related to revenue and expenditure and for revenue collection operations, while LSX is using it for the settlement of funds for securities (settlement of annual dividends and purchases of securities)⁵⁸.

Table 20 Participants of LaPASS(Category)

#	Name
1	Bank
2	Ministry of Finance
3	Lao Securities Exchange
4	LAPNet Company

Source) Survey team

A list of participating banks is shown in the table below.

⁵³ BOL, Payment System Development Strategy (2021-2025)

⁵⁴ 2022/4/27 JDB Interview

⁵⁵ 2022/4/27 BCEL Interview

⁵⁶ 2022/5/4 SACOM Bank Interview

⁵⁷ Responses from BOL to the Questionnaire

⁵⁸ 2022/5/11 BOL Interview

Table 21 List of banks participating in LaPASS

#	Name	#	Name
1	ACLEDA Bank Lao Ltd	20	Viet Bank
2	Agricultural Promotion Bank	21	Lao China Bank
3	ANZ Vientiane Commercial Bank Ltd	22	Lao Development Bank
4	Bangkok Bank PCL., Vientiane Branch	23	Malayan Banking Public Lao Branch
5	Bank Of Ayudha PCL., Vientiane Branch	24	MARUHAN Japan Bank
6	BANK OF CHINA LIMITED VIENTIANE BRANCH	25	Military Commercial Joint Stock Bank Lao Branch
7	Banque Franco Lao	26	Nayoby Bank
8	BANQUE POUR LE COMMERCE EXTERIEUR LAO	27	Phongsavanh Bank
9	Booyong Lao Bank Ltd	28	Public Berhad Bank Ltd, Savannakhet Branch
10	CANADIA BANK LAO LTD	29	Public Berhad Bank Ltd, Vientiane Branch
11	Cathay United Bank Vientiane Capital Branch	30	Public Berhad Bank Pcl., Sikhai Branch
12	CIMB Thai Bank	31	RHB Bank
13	First Comercial Bank LTD	32	SACOM BANK LAO BRANCH
14	Indochina Bank Ltd	33	Sai gon-Hanoi bank Lao limited
15	INDUSTRY COMERCAIL BANK OF CHINA	34	SIAM COMM BANK
16	International Commercial Bank Lao Ltd	35	ST Bank Ltd
17	Joint Development Bank	36	TAIWAN COOPERATIVE BANK VIENTIANE CAPITAL
18	KASIKORNTHAIBANK	37	Vietcombank Laos Limited
19	Krung Thai Bank Ocl, Vientiane Branch, Lao	38	ViettinBank

Source) Survey team based on a questionnaire survey of BOL.

4.2.3. Functions

As mentioned in the section above, LaPASS is a system that integrates RTGS and ACH, and settlements for large transactions are made in real time; interbank transfers for ACH are made based on OTC requests for transfers of LAK 100 million or less, with two separate designated time settlements at 10:30 AM and 2:30 PM. The settlement amount is notified 15 minutes prior to the time of settlement. BOL mentioned that there has only been one instance of a balance shortage to date⁵⁹.

In addition, LaPASS participants are required to maintain a minimum amount of funds in their settlement accounts to ensure liquidity, but since no collateral controls or specific values have been established, participants must be careful to maintain their checking account balances when settling.

Other functionalities that LaPASS is equipped with are listed in the table below.

Table 22 Functions of LaPASS

#	Functions
1	Credit
2	Debit
3	Fund Transfer
4	Customer credit transfer
5	Customer debit transfer
6	Clearing settlement

Source) Survey team based on a questionnaire survey of BOL.

⁵⁹ 2022/5/11 BOL Interview

Most financial institutions in Lao PDR adopt ISO 20022, which ensures mutual compatibility with LaPASS. The types of connection method available for LaPASS are, (1) Web-based connection (2) Direct connection through STP, and (3) Gateway connection through STP. It also has external connections to the Lao Stock Exchange and LAPNet (see below). Related guidelines and manuals for LaPASS are shown in the table below.

Table 23 Guidelines and manuals for LaPASS

#	Name
1	LaPASS operation guideline
2	Security guideline for financial institutions
3	Disaster recovery manual
4	Business continuity plan

Source) Survey team based on a questionnaire survey of BOL.

4.3.LAPNet

4.3.1. Overview

LAPNet is a company established in March 2019 as a joint venture by several financial institutions. There are 23 employees, including two members of the management team, and three departments (IT, Operation, and Administration). The table below shows the banks that have invested in LAPNet and their investment ratios, and the figure below shows an overview of LAPNet.

Table 24 Banks investing in LAPNet

#	Name	Investment Ratio
1	BOL	25
2	BANQUE POUR LE COMMERCE EXTERIEUR LAO	20
3	Union Pay International	15
4	Lao Development Bank	10
5	Agricultural Promotion Bank	10
6	Joint Development Bank	5
7	Laos-Vietnam Joint Venture Bank	5
8	BIC Bank Lao Co.,Ltd	5
9	ST Bank Co.,Ltd	5

Source) Survey team based on interview with LAPNet.



Figure 12 Appearance of LAPNet

Source) Survey team

LAPNet is operated as a successor to Lao ATM Pool System (LAPS), which is provided by BOL⁶⁰, and allows financial institutions participating in LAPNet and users of financial institutions participating in LAPNet to use ATMs to transfer funds to other banks. It also enables users to transfer funds between mobile wallets. Users can also use ATMs to withdraw cash and check account balances among LAPNet participating banks^{61 62}. The system operates 24 hours a day, seven days a week, and is technically maintained and operated by Sysmatik IT Solution, one of the subsidiary companies of AIF company⁶³.

Revenue history of LAPNet is shown in the table below.

Table 25 Revenue history of LAPNet

Year	Revenue (Million LAK)
2019	-200
2020	67
2021	200
2022 (Forecast)	200-300

Source) Survey team based on interview with LAPNet.

⁶⁰ AIF, <https://aifgroupplao.com/News/NewsDetails?id=20>, 2022/02/17

⁶¹ LAPNet, <https://www.lapnet.com.la/>, 2022/02/17

⁶² J&C group, <https://jclao.com/laos-banks-linked-for-money-transfers-via-mobile-app/>, 2022/02/17

⁶³ 2022/1/20 AIF Group Interview and received material

Financial institutions mentioned that high membership fees are a cost burden and a key issue for LAPNet; the per-transaction fee is a source of revenue for financial institutions, but LAPNet also collects a portion of the revenue, and the fees are not sufficient to cover the financial institutions' cost burden. As a result, there are some banks that are make a profit or loss from using the system⁶⁴.The membership fee is USD 15,000 for registration and up to USD 30,000 for renewal, The same fee is charged for the using the ATM system and mobile switching, but there is a small discount for users of the two systems.

The number of transactions per day is 22,700 for ATMs and 13,300 for mobile payments, with ATMs accounting for LAK 13 billion and mobile payments for LAK41 billion in terms of value⁶⁵.

A single transaction can transfer between LAK 1,000 and LAK 10,000, with a daily limit of LAK 50,000,000. The remittance fee is determined by the accumulated transaction amount, and details are shown in the table below.

Table 26 LAPNet fees

Cumulative usage amount (LAK)	Fees (LAK/time)
1,000 to 1,500,000	1,000
1,500,001 to 3,000,000	2,000
3,000,001 to 5,000,000	3,500
5,000,001 to 10,000,000	10,000

Source) Survey team, based on J&C Group (2020)⁶⁶

4.3.2. Participants

16 banks participate in the ATM switching system, and seven banks participate in the mobile switching system. The banks participatin in each are listed in the table below.

Table 27 Banks participating ATM Switching system

#	Name	#	Name
1	BANQUE POUR LE COMMERCE EXTERIEUR LAO	9	VietinBank Lao
2	Lao Development Bank	10	INDOCHINA BANK LTD
3	Joint Development Bank	11	ACLEDA BANK LAO.,LTD
4	Agricultural Promotion Bank	12	BIC Bank Lao Co., Ltd
5	MARUHAN Japan Bank Lao	13	Sacombank Lao
6	Laos-Vietnam Joint Venture Bank	14	ST BANK CO.,LTD
7	The Industrial and Commercial Bank of China	15	PUBLIC BANK BERHAD
8	Bank of China	16	KASIKORNTHAI BANK Limited

Source) Survey team based on interview with LAPNet.

⁶⁴ Interviews with Financial Institutions

⁶⁵ 2022/4/26 LAPNet Intreview

⁶⁶ J&C group, <https://jclao.com/laos-banks-linked-for-money-transfers-via-mobile-app/>, 2022/02/17

Table 28 Banks participating in Mobile Switching system

#	Name
1	BANQUE POUR LE COMMERCE EXTERIEUR LAO
2	Lao Development Bank
3	Joint Development Bank
4	INDOCHINA BANK LTD
5	MARUHAN Japan Bank Lao
6	Laos-Vietnam Joint Venture Bank
7	BIC Bank Lao Co., Ltd

Source) Survey team based on interview with LAPNet.

4.3.3. Functions

There are two functions: (1) ATM switching/Card switching and (2) Mobile Payment Switching. Both functions are used for switching between participating banks, but because there is little demand for credit cards, they have not been introduced into the system as a function. Users can transfer money between participating banks using ATMs or to each bank's mobile wallet using mobile applications. Implementation of QR Payment is planned to follow standardization of QR Payment (Lao QR), which is developed by the BOL⁶⁷ ⁶⁸.

LAPNet is also equipped with a function that nets transactions up to the previous day and automatically notifies each bank of the settlement amount at 4:00 AM every morning. With this function, LaPASS settles transactions in the morning. LAPNet is also equipped with a collective counting and reporting function, but collective counting is done by operators. Mobile transactions are mainly made to BCEL's One Pay.

4.4.IT vendors

4.4.1. CMA

The BOL has a support contract for LaPASS with CMA Small Systems, a vendor of packaged software, and receives support mainly for the program (application). CMA is a Swedish company that has installed interbank payment systems for 55 institutions, including RTGS, ACH, and CSD. Since its product development in 1997, it has expanded its RTGS, CSD, and ACH solutions, as well as MONTRAN, to include instant payments. ACH was introduced in Cambodia in 2012, and RTGS was introduced in Mongolia in 2018. Earlier results include introduction of RTGS and ACH in Lao PDR, CSD to the Hanoi Stock Exchange in Vietnam, and instant payment solutions to the National Payment Corporation of Vietnam (NAPAS) in Vietnam.

4.4.2. AIF Group

IT vendors are potential candidates for JV partners for future business development. During the field survey we interviewed AIF Group, a company established in 1991 with more than 3,000

⁶⁷ LAPNet, <https://www.lapnet.com.la/>, 2022/02/17

⁶⁸ J&C group, <https://jclao.com/laos-banks-linked-for-money-transfers-via-mobile-app/>, 2022/02/17

employees from 17 countries. In addition, total assets in 2020 were USD 1.13 billion and total capital and surplus is USD 319 million. AIF Group is expanding its business not only in Lao PDR but also in Thailand, Myanmar, Vietnam, Singapore, Cambodia, and other ASEAN countries. The AIF Group has a strong presence in the energy sector, financial services, real estate, and other areas⁶⁹.

4.4.3. Sysmatik IT Solution

Technical operation and maintenance of LAPNet is performed by Sysmatik IT Solution, a member of the AIF group. Mobile switching is 100% outsourced to Sysmatik IT Solution. Sysmatik IT Solution is a distributor of a software package called IBS Core Banking System in China and has implemented the system at BCEL and BIC Bank. It has strengths in IT system implementation for financial institutions⁷⁰.

In addition, on October 14, 2020, Sysmatik IT Solution signed a contract with the Bank of the Lao P.D.R. for a project to restructure the IT infrastructure. Commenting on the contract, Thanongsit Thepphongeun, Director of Sysmatik II Solution, said: "This is an important collaboration to ensure that the banking system will be ISO 27001 compliant in a phased manner⁷¹. The company is also currently working with the banking sector to provide Payment Gateway and other services such as fund transfers and QR Payment using open APIs.

4.4.4. SIRICHALERXAY

SIRICHALERXAY is an IT provider and a subsidiary of DDC Group, a major domestic construction company in Lao PDR. It is responsible for the IT portion of hydropower and other infrastructure projects and was established two years ago. It has recently been awarded projects from MTC. One of its achievements is LoudChat, which was launched in April 2022.

In April 2022, the company signed an MOU with MTC and is currently executing its second project, a feasibility study on a mechanism to enable data exchange between governments under the Government data exchange project, which is scheduled to last six months, and is expected to be completed by the end of March 2022. The project will connect nine government agencies (including the Ministry of Health and the financial sector such as BOL).

⁶⁹ AIF Group, A leading diversified group with unparalleled financial strength, 2022/06/27

⁷⁰ 2022/1/20 AIF Group Interview and Received Materials

⁷¹ J&C group, [BOL To Transform IT Infrastructure System \(jclao.com\)](https://www.jclao.com), 2022/0218

Chapter 5. Municipal Financial Institutions Survey

5.1. Municipal Financial Institutions

5.1.1. Banks

There were four state-owned banks (three state-owned commercial banks and one specialized policy bank), three joint venture banks, seven private banks, nine local corporations, and 19 foreign bank branches as of 2017.

As of 2017, total bank assets reached LAK 122.4082 trillion, accounting for 87% of GDP, of which state-owned commercial banks accounted for 44%, three state-owned commercial banks accounted for 56.7% of total deposits, and four state-owned banks accounted for 50.0% of total commercial bank claims⁷². Later, in 2021, the Lao Prime Minister's Office sold shares in the Lao Development Bank and Agricultural Promotion Bank to the private companies Charnsekon Energysi and Pongsap Thavee Bridge Irrigation Company. As a result, these two banks were treated as joint venture banks, leaving the Banque Pour Le Commerce Exterieur Lao as the only remaining state-owned bank⁷³. The following is an overview of the four banks that have been dominant in the Lao financial sector.

① Banque Pour Le Commerce Exterieur Lao, BCEL

BCEL was established in November 1989 as a result of the restructuring of the commercial banking division of the National Bank of the Lao P.D.R. under BOL Law and the Law on the Management of Commercial Banks. It is the largest bank in Lao PDR and has been listed on the Lao Stock Exchange since its inception, but the majority of its shares are held by the Lao PDR government.

② Lao Development Bank, LDB

LDB was established in April 2003 following the merger of Lao May Bank and Lao Xang Bank. Its main business is to provide loans to small and medium-sized enterprises.

③ Agricultural Promotion Bank, APB

APB is a state-owned policy bank established in 1993 as a development bank for the agricultural sector. In 2002, its non-performing loan ratio reached 88% due to its profit-seeking management and weak lending mechanism. It has been trying to rebuild its management since 2003. Against the backdrop of these efforts, according to the Vientiane Times [2011], the bank's NPL ratio shrank to 3.3% in 2010.

④ Nayoby Bank, NBB

Nayoby Bank (NBB) is a non-profit policy bank under the control of BOL, which was established in September 2006 as a result of the restructuring of the Agricultural

⁷² JICA, “Joint Policy Research and Dialogue Program for Fiscal Stabilization in Lao PDR”, 2022/02/10

⁷³ NNA POWER ASIA, <https://www.nna.jp/news/show/2170545>, 2022/02/22

Promotion Bank (APB). It provides low-interest loans as financial resources to farmers living in poor areas in order to eradicate poverty.

A list of banks in Lao is shown in the table below⁷⁴.

Table 29 List of banks

State - Owned Commercial Banks	
1	BANQUE POUR LE COMMERCE EXTERIEUR LAO PUBLIC
Specialized Bank	
2	NAYOBY BANK
Joint State Comercial Bank	
3	Lao Development Bank
4	Agricultural Promotion Bank
5	Lao-Viet Bank CO.,LTD
6	Banque Franco-Lao Ltd
7	Lao China Bank Co.,Ltd
Private Bank	
8	JOINT DEVELOPMENT BANK
9	PHONGSAVANH BANK LTD
10	INDOCHINA BANK LTD
11	Booyoung Lao Bank Ltd
12	Lao Construction Bank Limited
13	MARUHAN Japan Bank Lao Co.,Ltd
14	BIC Bank Lao Co., Ltd
15	ST BANK LTD.
Subsidiary Bank	
16	ACLEDA BANK LAO.,LTD
17	RHB Bank Lao Sole CO.,LTD
18	KASIKORNTHAI BANK Limited
19	SAIGON THUONG TIN BANK LAO Sole CO.,LTD
20	VietinBank Lao limited
21	Vietcombank Laos Limited
22	CANADIA BANK LAO CO.,LTD
23	Saigon-Hanoi Bank Lao Limited
Foreign Comercial Bank Branch	
24	Bangkok Bank public co.,Ltd Vientiane Branch
25	KRUNG THAI BANK LIMITED VIENTIANE BRANCH
26	BANK OF AYUDHYA PCL., VIENTIANE BRANCH
27	TMB Bank Public Company Limited
28	SIAM COMMERCE BANK LTD VIENTIANE BRANCH
29	PUBLIC BANK BERHAD
30	Public Bank Wattay Branch

⁷⁴ Shinya Watai , https://www.jica.go.jp/laos/office/information/report/ku57pq00002ua457-att/chapter_03.pdf ,2022/02/10

31	Public Berhad Bank Ltd, Savannakhet Branch
32	BANK OF AYUDHYA PCL., SAVANNAKHET BRANCH
33	Military Commercial Joint Stock Bank - Lao Branch
34	Industrial and Commercial Bank Of China Limited Vientiane Branch
35	Public Bank, Pakse Branch
36	CIMB Thai Bank Public Company Ltd Vientiane Branch
37	Cathay United bank-Vientiane capital Branch
38	Bank of China Limited, Vientiane branch
39	First Comercial Bank LTD, Vientiane Branch
40	Bangkok Bank Pcl, Pakse Branch
41	Malayan Banking Berhad Nongduang Branch
42	Malayan Banking Public Limited Company Lao Branch
43	Australia and New Zealand Banking Group Limited, Lao Branch
44	Taiwan Cooperative Bank, Vientiane Capital Branch

Source) Survey team based on BOL Web site.

5.1.2. Field survey

The table below outlines the results of interviews with the three major banks (BCEL, JDB⁷⁵, and LDB) that were surveyed in the field.

Table 30 Results of interviews with major bank

	BCEL	JDB	LDB
Number of employees (Of which ,ICT staff)	2,100 or more (168)	672 (40)	1,200~1,300
Number of branches	121	63	18
Number of ATMs	546	162	265
Status of core banking system	In place	In place	In place
Number of saving accounts	2,730,000	300,000	343,858

Source) Survey team based on interview with financial institutions.

5.2.Payment Service Providers

The table below shows the results of our interviews with Star Fintech and Lao Telecom, both of which are engaged in the cell phone fund transfer business.

⁷⁵ JDB is a traditional private bank established in 1989 and is listed as a major bank because it has the largest number of branches among private banks.

Table 31 Results of payment service providers interviews

	Star Fintech (U-Money)	Lao Telecom (M-Money)
Number of employees	25	25
Number of users	2,000,000	200,000
Number of Daily Transactions and value	300,000-350,000 LAK 5 billion	The number of transactions is unknown LAK 4.5 million (Cash withdrawals)
Purpose of use	Domestic remittance (specify telephone commission number or account number) Cash deposits and withdrawals Telecommunications telephone bill payment (top-up) Lottery tickets Utility Payments Donations	Payment of Invoices Funds transfer Telecom phone bill payment (top-up)
Number of agent	94 agents 1,000 service providers	314 agents which make deposits and withdrawals
QR payment	Implemented	Implemented
Compliance with EMV.Co	Not compliant (Attempted to develop, but abandoned due to lack of resources. Will be developed again.)	Compliant
Status of bank connections	Connect with BCEL,LDB,Lao Viet Bank,BIC(Remittance)	Connect with 10 banks, mainly BCEL,IndoChina Bank,LDB

Source) Survey team based on interview with payment service providers.

Both services are available nationwide and can be used in rural areas where there is Internet access. M-Money is also considering linking with TaxRIS, the Ministry of Finance's tax-related system, for Profit Tax for individual stores, etc.

Regarding external connectivity, although connections are being made with commercial banks, Payment service providers highlighted the management cost of connecting to each bank via separate APIs is as a key issue and cost burden for them.

An M-Money representative stated that this challenge can be attributed to the fact that each bank has a different interface to the core banking system^{76 77}.

5.3. Microfinance • Leasing Companies

5.3.1. Microfinance

According to a decree issued by the BOL in 2012, "Microfinance is defined as the provision of various financial services, including the provision of loans, deposits, and livelihood security through cash transactions to the poor, low-income groups and small enterprises⁷⁸.

⁷⁶ 2022/5/6 M-Money Interview

⁷⁷ 2022/4/29 U-Money Interview

⁷⁸ Lao Services Portal, "Decree on Microfinance Institutions No. 460/G, dated 3 October 2012", <http://www.laoservicesportal-dftp.com/index.php?r=site%2Fdisplaylegal&id=120#a2>, 2022/02/10

Table 32 Classification of microfinance functions

#	Name	Role
1	Deposit-taking MFIs (DT-MFIs)	Institutions that provide small financial services such as deposits and small loans.
2	Non-Deposit-taking MFIs (ND-MFIs)	Financial institutions that provide microcredit both domestically and internationally and take deposits in the form of loans or grants.
3	Microfinance projects (MFPs)	Projects established by village development funds, village banks, other organizations engaged in microfinance-like activities, or organizations funded by individuals.

Source) Survey team, from various sources

There are also businesses classified as non-bank sector in a broad sense, and according to a statistical report released by BOL in the second quarter of 2017, the number of non-bank sector businesses in the country is 176, of which 20 are deposit-based microfinance, 62 are non-deposit-based microfinance, 30 are savings and credit associations, 30 are leasing companies, 29 are pawnshops, and five are money transfer companies. The total asset value of these non-banking sectors was LAK 3,369.1 billion according to 2017 data, which appears to be in a growth phase⁷⁹. In addition, the Bank of the Lao P.D.R. regulates businesses classified as deposit-taking microfinance (DT-MFIs) and non-deposit-taking microfinance (NDT-MFIs) and savings and credit unions (SCUs), and the number of such businesses has increased from 34 in 2010 to 124 in 2018⁸⁰.

New capital requirements for microfinance were added in June 2022, and the amount required as capital was increased from LAK 3 billion to LAK 10 billion. The requirement for deposits has also been increased from LAK 10 billion to LAK 30 billion, Mr. Somphone, CEO of Ekphatthana Microfinance Institution (EMI), commented on this, "I guess BOL is indirectly trying to reduce the total number of microfinance institutions by encouraging mergers and consolidations⁸¹.

⁷⁹ BOL, "Monetary statistics Report II, 2017", https://www.bol.gov.la/en/fileupload/07-03-2019_1551928716.pdf, 2022/02/10

⁸⁰ JICA, "Joint Policy Research and Dialogue Program for Fiscal Stabilization in Lao PDR", 2022/02/10

⁸¹ 2022/7/18 Ekphatthana Microfinance Institution (EMI) Interview

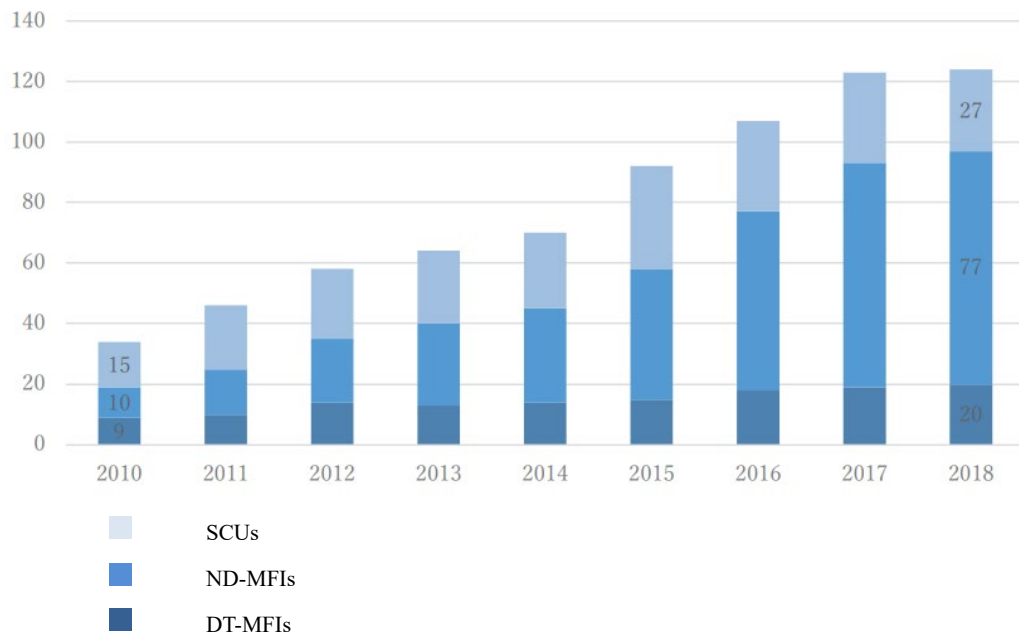


Figure 13 Changes in the number of regulated microfinance businesses⁸²

Source) Joint Policy Research Paper and Dialogue Program for Fiscal Stabilization in Lao PDR(2020)

One of the features of the business is that Ekphatthana Microfinance Institution (EMI), the largest deposit-based microfinance provider, offers a savings account with an interest rate of 5%, which is very attractive to users considering that the savings account interest rate of major commercial banks is 1.89%⁸³.

The following is a description of two rural financial services that are unique to microfinance in Lao PDR.

Table 33 Village savings groups and village banks⁸⁴

	Started	Current supervision	2019 data		
			Number	Depositors	Combined savings (Billion LAK)
Village Savings Groups	1997	LWU network	3,648	236,081	512
Village banks	2009	AFP project (BOL,GIZ)	670	153,000	269

Source) Joint Policy Research Paper and Dialogue Program for Fiscal Stabilization in Lao PDR (2020)

⁸²JICA, “Joint Policy Research and Dialogue Program for Fiscal Stabilization in Lao PDR”, 2022/02/10

⁸³ JICA, “Joint Policy Research and Dialogue Program for Fiscal Stabilization in Lao PDR”, 2022/02/10

⁸⁴JICA, “Joint Policy Research and Dialogue Program for Fiscal Stabilization in Lao PDR”, 2022/02/10

① Village Savings Groups(VSG)

The Village Savings Group was launched in 1997 in the peri-urban area of Vientiane Capital Region as a project of LWU with technical support from two Thai NGOs, FIAM (Foundation for Integrated Agricultural and Environmental Management) and CODI (Community Organization Development Institute) . This is a microfinance model. It is a semi-formal rural financial institution formed to collect the savings of local villagers, lend the funds to villagers in need, and distribute profits as dividends. However, surplus funds have become an issue in the pursuit of sustainable development⁸⁵.

② Village Banks(VB)

The lessons learned from the Village Savings Group led to the development of the Village Bank, with training manuals and operational systems developed in the Access to Finance for the Poor (AFP) project launched by GIZ in collaboration with BOL. The Village Bank is similar to the Village Savings Group in terms of organizational structure, regulations, and operational systems, but the main difference is the existence of the Network Support Organization (NSO). The NSO is a microfinance licensed organization that supports 40 to 100 Village Banks. According to AFP, there are seven NSOs in 2019, supporting 707 Village Banks in six states⁸⁶.

One of the challenges for microfinance is a lack of human resource capacity, especially in terms of accounting and microfinance knowledge, and accounting information is not properly recorded. There is a system called MB-WIN (MicroBanking System for Windows), which is used by many microfinance institutions to keep accounting books. However, because of the high cost of implementation, microfinance institutions that have not adopted MB-WIN manage their operations using Excel. The MB-WIN system was developed in 1999 as a joint project between the Food and Agriculture Organization of the United Nations and the former German Technical Cooperation (now Deutsche Gesellschaft für Internationale Zusammenarbeit)⁸⁷. Currently, 70% of microfinance institutions are said to be using MB-WIN, but as the system has become obsolete, the intention to replace it with a new system is being considered⁸⁸. Regarding the relationship between this new system and this project, Mr. Somphone, CEO of Ekphatthana Microfinance Institution (EMI), said, "Connecting one-on-one with each bank is both time consuming and expensive, so we wanted to be able to manage the system in a centralized manner. We are

⁸⁵ ISEAS, "Rural Finance in Lao PDR: Whither Village -Level Savings Groups?", https://think-asia.org/bitstream/handle/11540/13877/ISEAS_Perspective_2021_88.pdf?sequence=1, 2022/02/10

⁸⁶ JICA, "Joint Policy Research and Dialogue Program for Fiscal Stabilization in Lao PDR", 2022/02/10

⁸⁷ FAO-GIZ MicroBanking System, <https://www.mbwin.net/index.php?url=html/090Aboutus.htm>, 2022/06/23

⁸⁸ 2022/5/9 DTMFI_SinSabMueangNuea Interview

supporting the implementation of CBDC. There are also significant benefits to connecting with a funds transfer provider."

Some advanced microfinance institutions are considering introducing some of the functions of core banking systems (e.g., Optimal9) to improve operational efficiency and sophistication. In addition, most microfinance users in urban areas are government employees, while those in rural areas are farmers⁸⁹.

5.3.2. Leasing companies

According to the Lao PDR Leasing Law issued on July 2, 2021, leasing companies can engage in the following three types of transactions⁹⁰.

Table 34 Classification of leasing companies

#	Type	Contract Term	Ownership	Maintenance	After maturity	contractual
1	Finance lease	Medium-long term	Leasing company	Lessee (right of possession)	(1).Return (2).Purchase (3).Contract (re-leasing)	Renewal
2	Operating lease	Agreed term	Leasing company	Leasing company	(1).Return (2).Contract (re-leasing)	renewal
3	Hire purchase	Agreed term	Lessee (Ownership is transferred after completion of installment payments)	Lessee	Ownership is transferred	

Source) Survey team based on the ONE ASIA LAWYER(2021)

The table below provides an overview of the three companies surveyed in this study.

⁸⁹ 2022/5/12 BOL Interview

⁹⁰ ONE ASIA LAWYER, <https://oneasia.legal/7268>, 2022/06/14

Table 35 Overview of leasing companies⁹¹

#	Name	Leased products	Money collection method	NPL
1	KB KOLAO LEASING	Cars	Holds accounts at multiple banks and has monthly deposits made according to schedule; One Pay deposits also available	2.3%
2	AEON LEASING	Durable consumer goods (electronics, cell phones) Motorcycles	Money can be repaid via mobile applications (e.g., One Pay) in partnership with various banks.	3% or less
3	KRUNGSRI LEASING	Durable consumer goods (cell phones, etc.)	94% use online payment. The remaining 6% make payments in cash. (80% of customers settled via BCEL account)	0.2% or less

Source) Survey team based on interviews with leasing companies

We describe Leasing Company's findings based on AEON Leasing's business. AEON Leasing provides financing services through an intermediary relationship between consumers and dealers of gold and electrical appliances. Consumers can obtain financing for purchases of products and make monthly repayments to AEON Leasing. The company's most commonly financed product are cellular phones, followed by electrical appliances, with annual sales of approximately LAK 100 billion in FY2021, and profits of approximately LAK 3-4 billion. The company employs less than 130 people, including four IT staff with branches in Vientiane and Pakse. Users of the service are aged mainly in their 20s to 40s. At the time of the survey, the number of subscribers was approximately 25,000.

Customers can apply for the service in three ways: (1) over the counter, (2) online, and (3) mobile. When applying for the service, customers must present their national ID, bank account information, balance, and paycheck stubs to AEON Leasing. After that, an inquiry is made to the CIB (credit information bureau), and the approval process begins. AEON Leasing has partnerships with several banks/applications, specifically with U-Money, M-Money, LDB, Japan Maruhan Bank, Lao Viet, ACLEDA Bank, and BCEL (One Pay) for lease payment collection.

⁹¹ 2022/5/5,6 Leasing companies interviews



Figure 14 Interior appearance of AEON Leasing

Source) Survey team

Chapter 6. Retail Payment Method Survey

6.1. Payment Currency

Lao PDR introduced a single exchange rate system in 1988 and a managed float system for the exchange rate against the U.S. dollar in September 1995. The background of Lao PDR. also includes the sharp depreciation of the Lao Kip in the wake of the 1997 Asian financial crisis and US and Thai interest rate hikes from 2004 to 2005. Currently, the settlement currencies in the market are the Lao Kip, US dollar, Thai baht, and Renminbi, but challenges remain in promoting the use of the local currency⁹². Specifically, the lack of control over unauthorized transactions at border areas and the lack of a foreign currency policy that requires payment in foreign currency for goods imported from other countries and for equipment procured from other countries were cited as challenges⁹³. With regard to the current foreign currency circulation in Lao PDR, the percentage of bank deposits in Lao PDR denominated in Lao Kip was 50% in 2014, which approached that of foreign currency; but, in 2018 the percentage was 46% in Lao Kip and 54% in foreign currency. Foreign currencies are likely to be US dollars, Thai baht, and Renminbi, but the BOL has not announced details of these currencies. The Lao PDR's Foreign Exchange Control Law stipulates those domestic settlements are basically made in the Lao Kip, and there has been no deep "dollarization" of the Lao PDR, as in Cambodia, where 90% of deposits are denominated in US dollars and the dollar circulates throughout the country. However, the Lao Kip has been weakening in recent years, and it is believed that there is a growing preference among the public to hold their deposits in a foreign currency. In order to continue to gain the confidence of the public, it is essential for the government to strengthen and stabilize its macroeconomic management, including fiscal and debt management; and the government is making efforts to achieve this stability.

In addition, since around May 8, 2022, the supply of gasoline in the capital city of Vientiane has been disrupted, leading to social problems. The main reasons for the gasoline shortage are: (1) oil importing companies affected by the Covid-19 are facing severe financial difficulties, especially in procuring foreign currency; (2) there is a difference between the actual amount of oil procured and the reference CIF price used to calculate the official price, resulting in sales losses in some cases; (3) there is a reluctance to sell in order to raise prices⁹⁴. In response to this situation, on May 16 of the same year, Sonexay Sitphaxay Governor of BOL, held a press conference and explained, "As the country recovers from the Covid-19 disaster, the imbalance between the supply and demand of foreign currencies is accelerating due to the global rise in the value of the dollar and accelerating inflation. This is due to the existence of exchange offices that apply illegal rates and the vicious cycle that has been created by a rush by the public to secure

⁹² JETRO, <https://www.jetro.go.jp/biznews/2022/05/51227b427ef3e30f.html>, 2022/06/23

⁹³ 2022/5/12 BOL Champasak Interview

⁹⁴ JETRO, <https://www.jetro.go.jp/biznews/2022/05/2799c01b29090a6d.html>, 2022/06/16

foreign currency in response to the depreciation of the local currency, the Lao Kip, which has led to further depreciation of the Lao Kip⁹⁵.

6.2.Usage Status of Payment Method

Cash is the dominant means of payment in the market, with mobile wallets/mobile payment services, credit cards, and debit cards as other payment methods. However, only 0.6% of those aged 15 and older have a credit card and 12.7% have a debit card⁹⁶. Among mobile wallets, One Pay, a mobile wallet offered by BCEL, is dominant. One Pay is a QR payment-based service and is mainly used in stores to pay for goods. You can enroll in One Pay even if you do not have an account with BCEL, and there is no limit to the amount of money you can spend per month if you have an account, although there is a 7 million LAK/month cap for using only the mobile wallet. To start using One Pay, a user must have an ID and be at least 15 years old. The mobile wallet can be provisionally registered without going to a branch store, transferring money to a provisionally registered account number, uploading a photo of the registration ID and taking a selfie of the person's photo to complete the provisional registration application, which is verified manually by BCEL operators through verification. There are two ways to deposit cash into BCEL One Pay: by visiting a store and making a deposit, or by asking someone else to make the deposit for you.

Other mobile wallets offered by banks are listed in the table below.

Table 36 Mobile wallets provided by banks (Interviewee)

#	Bank	Service	Description
1	JDB	JDB Yes	Mainly tax payments and utility payments. Services for account holders.
2	LDB	LDB trust	Domestic transfers, transfers to other banks, insurance payments, loan repayments, tuition payments, telephone bills, utility payments, etc. There are two types of wallets with different maximum amounts.
3	MJBL	MJ Saduak	QR payments; account transfers (within own bank, also other banks: through LAPNet), bill payments, U-Money, and M-Money are connected separately. QR payments; tax payments to be supported in the future. MJBK was the first bank to connect to U-Money and M-Money and is proud to be the most advanced bank in the digital aspect.
4	KBANK	QR K bank	QR Payment (mobile application), fund transfer between users, telecommunication top-up (in cooperation with Unitel and Lao Telecom), exchange of currency (LAK-THB), multiple service points (stores, etc.)
5	SACOM Bank	365 Pay	Originally created by SACOM Bank in Vietnam, but introduced to Lao PDR because it was not used in Vietnam. Supports Vietnamese, Laotian, and English.
6	ACLEDA	ACELEDA Mobile	Account balance inquiry, QR payment, wallet-to-wallet transfer, Cardless withdrawal (ATM), loan payment (Aeon

⁹⁵ JETRO, <https://www.jetro.go.jp/biznews/2022/05/51227b427ef3e30f.html>, 2022/06/16

⁹⁶ World Bank, <https://globalindex.worldbank.org/>, 2022/06/23

#	Bank	Service	Description
			Leasing, Krungsi Leasing: have ACELEDA account), insurance payment (Prudential Life) are available.
7	IndoChina	IB cool	It is a mobile application and the customer and merchant own the wallet.

Source) Survey team based on interviews with financial institutions interviews

In addition, QR Payment services by various banks are in disarray at retailers, and retailers are now using multiple QR codes in a confused situation.



Figure 15 QR codes at a cafeteria

Source) Survey team

6.3. Status of QR Code Standardization

The BOL has been leading development of a QR Payment standard called the Lao QR Code starting in 2020⁹⁷. Once standardization is completed, it is expected that QR payments will be possible among banks compliant with the standard QR code. BCEL and BIC are studying the possibility of interconnection. In this regard, BOL states: "Through the standardization and development of QR codes, we aim to make domestic payments more secure and robust while enhancing convenience, contributing to the development of international payments, realizing a cashless society, and developing the digital economy"⁹⁸. In Lao PDR, banks that use QR payments are charged a membership fee, which differs from Japan, as banks are not charged per transaction. (In Japan, QR code payments are subject to the same fees as credit card payments when a product or other item is sold, and payment is made⁹⁹.)

There are two types of QR payment methods: CPM (Consumer Presented Mode), in which a

⁹⁷ BOL, https://www.bol.gov.la/en/fileupload/02-04-2020_1585800369.pdf, 2022/06/23

⁹⁸ BOL, https://www.bol.gov.la/en/fileupload/02-04-2020_1585800369.pdf, 2022/06/16

⁹⁹ Square, <https://squareup.com/jp/ja/townsquare/cost-of-qr-code-payment>, 2022/06/23

QR code is displayed on a user's smartphone and held over a device, and MPM (Merchant Presented Mode), in which the QR is read by the user's terminal. Only the MPM method is being considered for the Lao QR Code^{100 101}.

The specifications for the Lao QR Code are being studied in accordance with the standard specifications set by the EMVCo. This EMVCo is an organization comprising six companies (American Express, Discover, JCB, MasterCard, UnionPay, and Visa), which published the first version of the EMV® QR Code Specification for Payment Systems (EMV® QRCPS) Merchant-Presented Mode," which was first published by this organization in 2017¹⁰².

¹⁰⁰ TIS, https://www.tis.jp/service_solution/qr-gateway-service/, 2022/06/23

¹⁰¹ 2022/4/27 BCEL Interview

¹⁰² EMVCo, <https://www.emvco.com/>, 2022/06/23

Reference 1st Field Survey Interviewee

Date	Category	Interviewee
25 th Apr	Central Bank	Bank of the Lao P.D.R. (Payment System Dept)
26 th Apr	Payment Infrastructure	LAPNet
26 th Apr	Retail business	Café & Craft
26 th Apr	Industry Associations	Lao ICT Association
27 th Apr	Banks	BANQUE POUR LE COMMERCE EXTERIEUR LAO PUBLIC
27 th Apr	Banks	Lao Development Bank
27 th Apr	Banks	JOINT DEVELOPMENT BANK
28 th Apr	Ministry	Ministry of Finance, (Financial Technology Dept.)
28 th Apr	Ministry	Ministry of Technology and Communications (Department of Information and Communications Technology)
29 th Apr	Payment Service Provider	Star Fintech (U-Money)
29 th Apr	IT Vendor	AIF Group (Marketing Team)
4 th May	Banks	SAIGON THUONG TIN BANK LAO Sole CO.,LTD
4 th May	Banks	KASIKORNTHAI BANK Limited
4 th May	Banks	MARUHAN Japan Bank Lao Co.,Ltd
5 th May	Banks	INDOCHINA BANK LTD
5 th May	Leasing Company	KB Kolao Leasing
5 th May	Microfinance	Ekphathana Microfinance Institution (DT-MFI)
5 th May	Banks	ACLEDA BANK LAO.,LTD
6 th May	Leasing Company	Krungsri Leasing
6 th May	Leasing Company	Aeon Leasing
6 th May	Payment Service Provider	Lao Telecom(M-Money)
9 th May	Central Bank	Bank of the Lao P.D.R. (Luang PraBang Branch)
9 th May	Microfinance	SSMI(DTMFI)
10 th May	Microfinance	SCU Luangprabang
11 th May	Embassy	Embassy of Japan in the Lao PDR (Minister, Nakano, Second Secretary, Ohmori)
11 th May	Central Bank	Bank of the Lao P.D.R. (Payment System Dept, Banking Operation Dept, IT Dept.)
12 th May	Central Bank	Bank of the Lao P.D.R. (Champasak Branch)
13 th May	Microfinance	CPS(DT-MFI)
16 th May	IT Vendor	AIF Group (Marketing Team, Business Developing Team)
17 th May	Central Bank	Bank of the Lao P.D.R. (Payment System Dept.)

Reference 2nd Field Survey Interviewee

Date	Category	Interviewee
11 th Jul	Central Bank	Bank of the Lao P.D.R. (Savannakhet Branch)
11 th Jul	Central Bank	National Bank of Cambodia (Bakong Team)
11 th Jul	Microfinance	Sayyal samphan Microfinance
13 th Jul	JETRO	JETRO Laos Office
13 th Jul	Embassy	Embassy of Japan in the Lao PDR
14 th Jul	Central Bank	Bank of the Lao P.D.R.(Deputy Governor)
14 th Jul	Industry Group	Lao ICT Association
15 th Jul	JICA	JICA Laos office (Chief Representative, Nagase, Project Formulation Advisor, Terada)
15 th Jul	Banks	BANQUE POUR LE COMMERCE EXTERIEUR LAO PUBLIC
15 th Jul	IT Vendor	AIF Group (Marketing Head)
18 th Jul	JICA	JICA Laos office (Chief Representative, Nagase, Senior Representative, Ito)
18 th Jul	Microfinance	EKphatthana Microfinance Institution (CEO)
19 th Jul	Law firm	One Asia Lawyer Laos office
19 th Jul	Central Bank	Bank of the Lao P.D.R. (Payment System Dept.)
21 st Jul	Central Bank	Bank of the Lao P.D.R. (Payment System Dept.)

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