Blockchain for digital government – the ASEAN way.

Proponent Country:

Lao PDR

Implementing Agency:

Center of E-Government

2021

ADGSOM Project Completion Report

Blank 1

Executive Summary

The blockchain technology has come a long way than we actually perceived. The 2008 first bitcoin is only the tip of the iceberg where blockchain or distributed ledger technology being put into practice. In the turn of 2021, the crypto-currency has become more main stream adding more fuel to ASEAN member states to re-think and adapt to leverage the technology.

The paper study blockchain technologies for government service's digital transformations in order to map opportunities, challenges, gaps, and put forward recommendation on how ASEAN states together leverage this upcoming technology to create trusted and transparent digital services.

The study examine current status of how each government see blockchain in their national ICT vision; evaluate blockchain technology trends in terms of tools, standards, or communities that are likely to be suitable for digital government transformation especially those which are being considered in China, Korea, Japan and European Union, and compare blockchain adoption case studies in order to recommend different route that ASEAN policy makers can consider in leveraging the technology.

The Literature highlight the multiple use cases of blockchain technologies adopted by various governments. We understand that blockchain is not only for cryptocurrency but also beneficial and can be used for health record in Estonia, land tittle asset and intermediary of data storage in Sweden, as registry of public services in UK, electronic signature in the US, and also improve efficiency for tax refund in China.

As much as the benefit of blockchain technology, we touch upon the area whether there is a need to regulate the technology as AMS regulator have to be aware of. We boil down the approach taken by different countries or continent into four main

categories as such The fearful approach, The Curious approach, the Adaptive approach, and Parallel economies approach depending on the needs of law, people and the economics of the applied technology. These approaches are decided by the ideology of each government which put its citizen right into “right to be forgotten”, “business first, regulation later”, “regulation first, business later”. The experience learnt from other earlier reflect the survey result that AMS has already read embrace the blockchain technology where we see the big shift in the recognition of the blockchain into national ICT strategy despite the fact that more than 80% of AMS still in early phase of technology adoption.

Key Findings

- Blockchain has become more important to AMS ICT Master plan 2020-2025 where top management see it as integral part of the upcoming strategy and the technology itself is becoming mainstream
- Majority of AMS agree that private sector should involve in the blockchain technology development for e-services
- The regulating part is in more progressing stage where 56% claiming to have committee from public and private sector to look into the issue or having dedicate team drafting the blockchain standard and regulation
- AMS in general agreement that blockchain is suitable technology for e-services
- Healthcare, Revenue generating are the key areas where AMS believe blockchain can be most beneficial. Nonetheless, AMS do not believe that it will solve legal enforcement issues
- The understanding of technology amongst AMS regulator remain very low; human resources are needed to assist regulators
- The adoption of blockchain technology for government e-services remain very low with only less than 5% of the project live
- Each continent adopt different approach in embracing the technologies. It’s boiled down to 3 major “right to be forgotten”, “business first, regulation later”, “regulation first, business later”

Key Recommendations

- AMS should set up working group to share ideas how to govern the blockchain
- AMS should streamline the involvement of private and public sector in order to accelerate the policy development
- Shared infrastructure can help optimize scared resource. The AMS blockchain network might provide stepping stone for ASEAN blockchain and help stabilize the fees
- Least developed countries, Cambodia, Lao PDR and Myanmar, have limited budget to develop ecosystem for blockchain
- Human resource improvement among relevant ministries

Blank 2

Table of Content

List of Figures

List of Tables

Blank 3

Chapter 1: Introduction

I. Background

Blockchain technology, as distributed ledger, can hypothetically reduce bureaucracy, increase the efficiency of administrative processes and increase the level of trust in public record keeping. It was accelerated by the invention of bitcoin by Satoshi Nakamoto just over a decade ago (in 2008) to serve as the public transaction ledger of the cryptocurrency bitcoin. The bitcoin use of blockchain that solve the double-spending issue has inspired other applications as such smart contract, crossed border financial services, undeletable custodian system, blockchain supply chain, and many other applications which involve transaction and asset.

With so many hype and expectation around the blockchain band-wagon, How ASEAN can leverage the technology, will the technology really bridging the trust between our citizens and government in e-service arena, can ASEAN together build blockchain nodes of technology to form our own intra-governmental blockchain are some of the key discussion points we need to bring forward. Therefore, we need a proper assessment of such use that requires a discussion on blockchain standards, applications, and opportunities that are currently in development, or may develop in the future. Without this, any potential use of blockchain in government will be of limited and restricted or worst take the wrong route. This study would render our discussion on government applications using blockchain. The study enable us to appreciate blockchain applications in a useful way for future applications outside the context of government. Focusing our attention on blockchain for government applications is needed.

Realising its potential benefit, some ASEAN members have already started to explore its use cases. For instance, Vietnam Ho Chi Minh (HCM) City will develop a blockchain infrastructure to aid its smart city transformation which will be used to mitigate risk and streamline processes; while Thailand Revenue Department was testing blockchain to track VAT payments and prevent fraud by companies using fake invoices for deductions; furthermore, Singapore government also partner with DBS Bank to launch blockchain trade platform to increase efficiency. Blockchain seems

very exciting yet simultaneously a bit of hypes, and naturally many people, businesses, and governments approach it with high expectations while also exhibiting some hesitancy. The hesitancy comes with question of what blockchain actually is, what are the success case of blockchain adoption with best industry standard, or will government eventually lose control over technology deployed on blockchain?

The direct beneficiaries of the project are ASEAN participants of policy makers, the expert meeting, managers, engineers and employees from regulators, government organizations, telecommunication operators and academia.

The indirect beneficiaries will be:

1. ASEAN citizens who use digital services that will required blockchain;
2. The e-services and digital government services developer community;
3. ASEAN Blockchain solution providers.

II. Objectives

The project aims to study blockchain technologies for government service's digital transformations in order to map opportunities, challenges, gaps, and put forward recommendation on how ASEAN states together leverage this upcoming technology to create trusted and transparent digital services.

The study shall (1) examine current status of how each government see blockchain in their national ICT vision; (2) evaluate blockchain technology trends in terms of tools, standards, or communities that are likely to be suitable for digital government transformation especially those which are being considered in China, Korea, Japan and European Union, (3) compare blockchain adoption case studies in order to recommend different route that ASEAN policy makers can consider in leveraging the technology.

III. Scope of the Study

The Project will carry out the following activities:

1. Literature review of blockchain technology trends of applications, standards, and community's usage of blockchain to find out the what blockchain really is and how it will likely bring the benefit to digital government.
2. Carry out survey of status of blockchain use cases being considered in each ASEAN Member States to understand the gaps of policy and technology standards between least developed countries and highly developed countries of blockchain adoption.
3. Organize two day dialog to evaluate use cases by sharing ideas between ASEAN head of ICT policy makers and blockchain use case vendors such as (1) Krungsi Bank (Thailand) who adopt smart contract for bank guarantee, (2) Femina Digital ID who provide self-sovereign digital ID, (3) Fujitsu Blockchain innovation center who examine different use cases of blockchain for society. The Experts and representative shall share experience on how they use blockchain technology to solve social problems and the working group shall draw together on how policy makers can promote the technology, therefore, define policy choices on blockchain adoption for ASEAN.

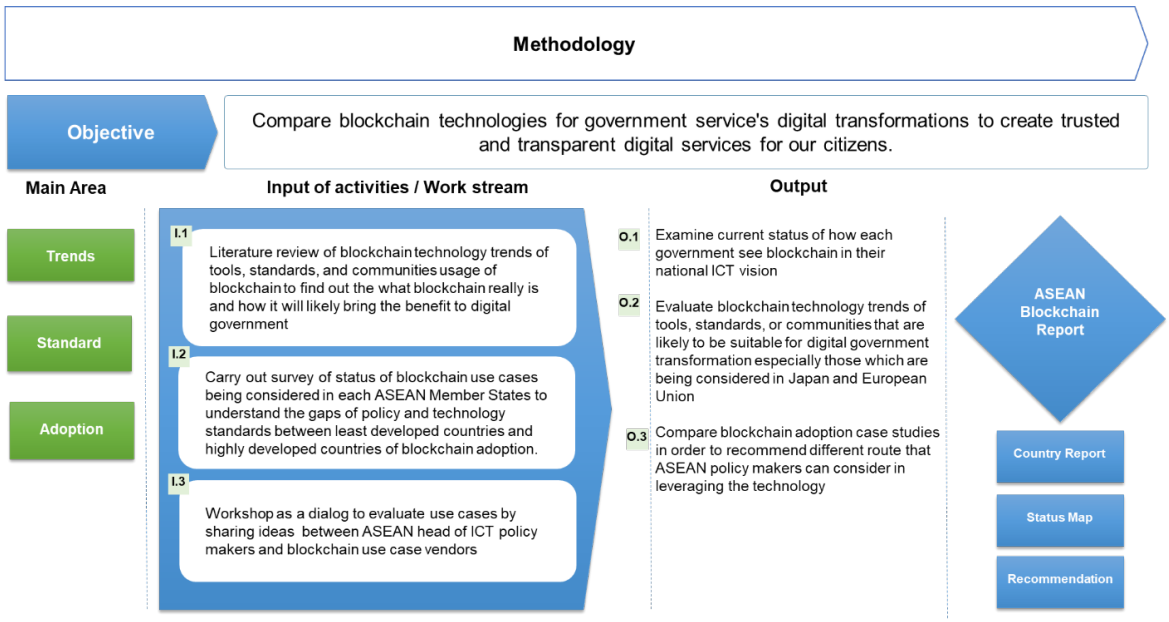


Figure 1 Research Methodology

IV. Expected Outcome

The Project outcome will be a gap analysis with the following indicators:

Outputs	**Indicators (to measure the project's achievements)** *How will the project's achievement be measured? Please indicate feasible quantitative or qualitative factor.*	**Means of Verification** *How will information be collected to support these indicators?*
1.Litterature review Report	Accademic review of litterature indicating focus of this research in ASEAN context in comparision to China, Korea, Japan and European Union	-Definition of blockchain -Evaluation of existing blockchain standards -Evaluation of existng blockchain adoption cases
2. Survey analysis of Blockchain adoption in ASEAN digital government applications	Number of countries' feedback; survey result; assessment report.	- Gap Analysis map comparising adoption of blockchain in ASEAN vs. EU and Japan ; - Statistics result of survey.
3. Survey analysis of Blockchain standard being considered in ASEAN ICT Policy	Number of countries' feedback; survey result; assessment report.	- Gap Analysis map comparising blockchain standard being considered in ASEAN vs. EU and Japan ; - Statistics result of survey.
4. Seminar on how ASEAN member states adopt Blockchain in digital transformation plan	-The number of participants nominated by ASEAN member states; -The number of speakers engaged in the expert meeting; -The satisfaction of participants.	-Statistic used to caculate the number of participants/speakers; -Evaluation survey of the expert meeting satisfaction. -Seminar report
5. Finals report presenting the results of project.	- The final reports are submitted to ASEAN secretariat on time and circulate to all member states for reference; - The adoption of the project results by ASEAN member.	- Quality of final reports of the project: reference index in various research papers; -Key findings -Key recommendations -Possibly guideline of how ASEAN member can together create joint blockchain adoption framework

A1: Literature review of China, Korea, Japan and European Union blockchain technology trends of tools, standards, and communities usage of blockchain to find

out the what blockchain really is and how it will likely bring the benefit to digital government

- Evaluate blockchain technology trends of tools, standards, or communities that are likely to be suitable for digital government transformation especially those which are being considered in Japan and European Union
- Make key finding of mainstream blockchain technology which are being adopted; the pros-cons of each technology
- Make key finding of key vendors, their core technology, and forecast of future blockchain development directions
- Examine alternative technology which might be blockchain killer app

A2: Carry out survey of status of blockchain use cases being considered in each ASEAN Member States to understand the gaps of policy and technology standards between least developed countries and highly developed countries of blockchain adoption.

- Compare blockchain adoption case studies to recommend different route that ASEAN policy makers can consider in leveraging the technology
- Compare status of each ASEAN countries adoption state of blockchain vs. other technology

A3: Workshop as a dialog to evaluate use cases by sharing ideas between ASEAN head of ICT policy makers and blockchain use case vendors Examine current status of how each government see blockchain in their national ICT vision

- Share ideas from expert in the field and policy makers to create common understanding of blockchain adoptions
- Joint development of recommendation to synchronize invention with policy direction
- Set forth possible ASEAN blockchain adoption roadmap

Chapter 2: Literature Review of Study Framework

I. What is blockchain

Blockchain technology was appeared in 2008 with the introduction of Satoshi Nakamoto from the Bitcoin: Peer-to-Peer Electronic Cash System. A platform that can provide security in the exchange of digital currency with the purchase of Bitcoin. There is no need for an intermediary like the bank or other entity to pay. In the past 10 years, there have been some startups to adopt the concept of blockchain technology in other areas. It is expected that Blockchain technology will change our lifestyle in the future.

Blockchain technology is a technology to store information without intermediaries (Third Party) to collect information. Generally, keeping digital data must have a server or central data center (Data Center) in storage. Blockchain will radically change the way we work. All members have equal rights in the transmission of data. The mechanism of this system has an encryption of information in order to maintain the security of the information. If the information has changed, all members of the network must review the information to verify the accuracy of the information (Digital Government Development Agency, 2019).

II. Application of blockchain

Application blockchain is not limited to the private sector, the government sector also applies as well. In recent years, the science and technology consulting agency of the United Kingdom Government (UK Office of Science) has published recommendations on the application of blockchain technology to the government sector to the UK government. There are five ways in which the proposed approaches are presented.

1. It is used to store information that needs security from cyber-attacks.
2. It is used to store information, including payment of welfare and pension, to resolve leakage problems, including overlapping payment of government benefits payment systems
3. Foreign aid payments, especially in least developed countries, are often found that the UK government aid does not meet the objective of the

adoption of blockchain in digital money which makes it easier to control and monitor the use of money.

4. Reduce the burden of transaction costs of SMEs in recording various assets such as land patents and various registration in the form of blockchain.
5. The collection of Value Added Tax (VAT) in Europe is complicated due to inconsistent of the system among memberships. Blockchain systems can help to collect data of trading which support the inspection and transaction.

III. Experiences from various countries

1. Estonia

The government of Estonia's focused on increasing technological potential for people since the country has changed from a communist system to liberal democracy. Estonia began building digital environment through the e-government service in 1997. The country has completely rebuilt the public service by bringing the blockchain technology to be used in national infrastructure and government management. Currently, approximately 99% of public services is e-services (PWC, 2019).

Access to government information and services can be made online by digitally identifying which is useful for updating information for government sector, business operation, and public health. A key sophisticate digital infrastructure is “the X-Road” that allows the nation’s public and private sector e-service information system to link up and function harmony. KSI is the complement of X-Road to provide a high speed and real-time authentication for all digital asset network. This blockchain technology is used for independent verification of all government processes and protecting e-governance services offered to the public (Govchain, 2021).

Estonia also applied Blockchain technology to health sector. Blockchain technology secures health information and able to authorized individuals. For example, people can also access their own health information by inserting ID card to a data reader connected to an electronic device such as a laptop or tablet. As a result, patients who have to repeat the same drug do not need to go to the hospital but they can bring the prescription that the doctor has sent to show to any drugstore at your convenience. Elder people are able to take care of their health and access medical

treatments more easily. At the same time, doctors can have access to health and medical history information of patient such as blood type, drug allergy history, and even X-ray films from other hospitals of the patient immediately; thus, allowing the treatment to be timely and doctors can diagnose the disease more accurately without having to rely on the words to tell the symptoms of the patient (Creative Thailand, 2017).

2. Sweden

Sweden, advanced countries on digital, has some of the most sophisticated digital ecosystem. In 2018, Sweden becomes the first cashless society as approximately 99% of the transaction were made by digital payment. In this context, the government has taken an open approach to blockchain technology and has been testing its use in many different aspects of society (GovChain, 2021).

The Swedish Department of Lands (Lantmäteriet) has official launched a blockchain system for registering land and real estate information provided by companies, organizations, government agencies and all related to land management are recorded in the same system. The blockchain system is and intermediary for data storage, started in July 2017, to develop a management system for real estate transactions for buyers, sellers, tenants, and the government.

Blockchain technology allows the private and public sectors to manage land-related information in the country to solve the duplication of land assessment problems from the fact that financial institutions have to send their appraisal team to evaluate and the collect of information about the land constantly which resulted in enormous expenses. Putting the land title in blockchain system will establish a central condition that all parties must follow the same structure before importing data into and out of the blockchain system. This will enable all parties to access and use the information easily, conveniently, and quickly (Blockchain and 3 for solving global real estate industry, 2017; Blockchain.Fish Team, 2017)

3. United Kingdom

The UK has the potential to become a leader of global blockchain as the country has sophisticated legal and regulatory system that will support the ecosystem for businesses and entrepreneurs. Blockchains have been implemented at the UK

Government, Parliament, and the Financial Conduct Authority (FCA). The UK government has been assessed and invested more than $30 million in the blockchain technology. The UK Parliament has established the All-Party Parliamentary Group on Blockchain (APPG Blockchain) to analyses and advocates for the disruptive impact of blockchain and the positive effects that it can bring to the UK economy on both an industrial and governmental level. The FCA implemented policies to promote blockchain innovation along with eleven other financial regulators and related organizations. In addition, the UK government studied the use of blockchain technology for public service such as Department for Work and Pensions, Department for Environment, Food and Rural Affairs, HMRC's and HM Land Registry (GovChain, 2020).

4. USA

The United States is one of the pioneers of blockchain with a pilot project many states such as Illinois, Colorado, Ohio and Delaware. Illinois launched the Illinois Blockchain Initiative to determine if this groundbreaking technology can be leveraged to create more efficient, integrated and trusted state services, while providing a welcoming environment for the Blockchain community. Colorado aims to exempt cryptocurrencies and certain digital tokens from securities laws. Ohio has amended the Uniform Electronic Transactions aim at promoting electronic signatures through blockchain technology (GovChain, 2021).

Delaware has been focused on the adoption of blockchain in government operations. The state law legislation allows private companies to offer their stocks without issuing certificates but to confirm the various transactions through the blockchain system. Delaware has initiated a pilot program to register business through the blockchain system and in the process of studying and researching the feasibility of creating a system of IPO systems through blockchain (Phophatthanachai, 2018).

5. China

The Chinese Government has announced on the 13th Five-Year National Informatization that would use blockchain technology to improve efficiency of government service such as taxes collection, tax refund and issuing tax documents in the form electronic, health data recording, etc. Recently the country development plan is taking place in a concrete way (Wongthawatchai, 2017)

The People Bank of China supported a blockchain-based trade finance platform to leverages the transparent and immutable properties of blockchain and to facilitate a regulatory system for trade finance (GovChain, 2021).

China also apply blockchain technology in Food Supply Chain Traceability System. Currently, food safety attracted attention of academics, private and public sector as food safety is one of UN Sustainable Development Goal. Therefore, every sector has endeavor to innovate and develop Innovation for food safety traceability plus the evolution of IoT (Internet of Things) and Blockchain technology that enable to track the safety of food from the production process until reaching the consumer's hand (Wongthawatchai, 2017)

6. Japan

Japan's Ministry of Internal Affairs and Communications has tested a blockchain system for facilitating the procurement and budget systems of government as well as share and store the information of procurement, approvals budget and private contract bidding among various departments to modernize the administration of Japanese government (Wongthawatchai, 2017).

7. India

The National Institution for Transforming India (NITI) has an idea to apply blockchain system for suppressing counterfeit drugs by the end of 2018 because the World Health Organization (WHO) reports that about 20% of medicines sold in India are of inferior quality standard, and approximately 35 percent of counterfeit drugs sold worldwide come from India. Thus, NITI adopted blockchain system to suppress counterfeit drugs which have a unique identification code. At every step, consumers can also scan the QR Code or Barcode on the medicine bottle. A smartphone-based mobile application to check the production source and complete history of medicines. In addition, NITI has also put the blockchain system to test in many sectors such as education, health and agriculture (Wattanasap, 2018).

Chapter 3: Policy & Regulatory Implication on blockchain technologies

The team used desk study to examine the implication of regulating blockchian technology. We try to answer the questions:

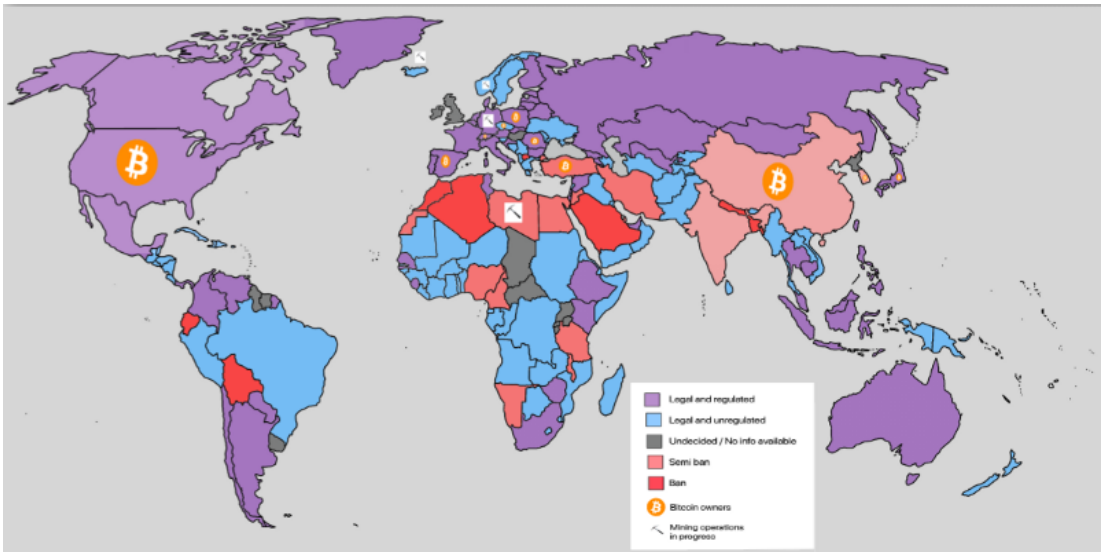
- Is there a need to regulate decentralized technology
- What are the pros and cons of regulating the technology
- Can we as the government regulate the technology
- What we can and cannot regulated
- How ASEAN can look into the decision or direction on regulating the decentralized technology

I. The Needs to regulate blockchain technology

We look into how expert classified the approach of government around the world see the adoption of blockchain technology, especially for bitcoin perspective, into four main categories as such The fearful approach, The Curious approach, the Adaptive approach, and Parallel economies approach which depending on how each group legalize or regulate the bitcoin. The following table show the legal situation of how the government look at blockchain technology.

Continents	Legal
North America	Legal, regulated
South America	Legal, indecisive, two countries are hostile
South East Asia	Legal, mostly regulated
West Asia	Illegal, hostile, not regulated
North Asia	Legal, regulated
South Asia	Legal, regulated
Europe	Legal, regulated
Africa	Indecisive – legal and illegal - Hostile and friendly
North Africa	Illegal, hostile
South and Central Africa	Legal, unregulated

Following map shows how each country trying to regulated cryptocurrency



(Finextra, 2021)

While blockchain has gained international attention for being the mechanism underpinning major cryptocurrencies such as Bitcoin and Ethereum, blockchain technology has huge positive potential: to decentralize and streamline financial transactions on a global scale. Nonetheless, regulatory agencies are still catching up to an ever-changing landscape, and many are in a state of disagreement about where blockchain fits into the future of the international commercial ecosystem.

TPP Technology (TTP Technology, 2021) predicts that The governments will tighten regulations related to fintech as more decentralized finance (DEFI) starts to surface. European Union legislators are implementing an EU-wide regulatory system for the crypto asset market, including an increase in token investment as a complex investment tool. Recently, after allowing it's business to run bitcoin mining for sometimes, the Chinese Vice Premier Liu He and the State Council said in a statement on 21-May-2021 that tighter regulation on cryptocurrency is needed to protect the financial system (CNBC, 2021) The EU strongly supports a EU-wide rules for blockchain to avoid legal and regulatory fragmentation. The Commission adopted a comprehensive package of legislative proposals for the regulation of crypto-assets in

order to increase investments and ensure consumer and investor protection (European commision, 2021)

The Fortune (Z.Chen, 2021) ague that despite the huge potential many regulatory agencies are debate on how decentralized technology can fit into the international commercial ecosystem; let alone catching up with ever changing technology then group how the government approach into regulating blockchain as (1) right to be forgotten, (2) business first, regulation later, and (3) regulation first, business later

While European Union take a The Curious approach to blockchain and are more concerned on the GDPR that EU citizens have a **"right to be forgotten"** online is debatable how user data remain intact within the blockchain network as it cannot be deleted or altered; compared to the (Finextra, 2021) fearful approach by the Asian government takes a more business mindset **"business first, regulation later"** in embracing the technology allowing blockchain companies to operate without restriction but regulate heavily on the financial aspect showing in the restriction of ICOs (initial coin offering) within the country by China, Korea, Japan. The U.S. government agencies has taking a **"regulation first, business later"** approach leaning toward a more The Adaptive ones that the Securities and Exchange Commission has mandated that cryptocurrencies will be considered "assets" under governmental purview, deterring many major international crypto-companies from wanting to operate in America.

Here's a breakdown of how major global actors are approaching the regulation of blockchain:

We've learnt that the EU, based on the existing consumer protection, has taken a firm stance on data privacy, implementing stringent regulations that have notable implications for blockchain. The General Data Protection Regulation (GDPR), which took effect on May 25, seeks to harmonize data privacy efforts across the union, mandating, in particular, that EU citizens have a "right to be forgotten" online.

For many blockchain companies, this right may contradict the immutability and decentralization that the technology provides its users. The new GDPR standards rest upon the moral foundation that EU citizens should have the fundamental right to control their data. The onus, therefore, will fall on blockchain companies to ensure that the EU threshold for data ownership is met sufficiently.

East Asian countries, by contrast, have until recently taken a “business first, regulation later” approach, in which government agencies have allowed blockchain companies to operate without restrictions. But as cryptocurrencies exploded last year, East Asian nations began to subject blockchain to more significant regulatory scrutiny.

While China was once considered to be an international refuge for cryptocurrencies, this changed abruptly in 2017 when the People’s Bank of China banned initial coin offerings (ICOs) in the country, sending a clear signal that cryptocurrency exchanges in their present form would not be tolerated. South Korea followed suit, stating that while blockchain technology was generally encouraged within its borders, domestic ICOs were banned for the foreseeable future.

South Korea’s blockchain community has flourished in recent years. While the government views blockchain technology favorably, it has yet to define its stance on the legal and regulatory aspects of funding and trading cryptocurrencies—leaving the South Korean market uncertain. In addition, domestic ICOs have been banned for the foreseeable future.

Japan was one of the first countries in the world to recognize Bitcoin as a currency and to issue cryptocurrency exchange licenses to businesses seeking formal classifications under the law. At the same time, Japanese regulatory bodies have restricted their assessment of cryptocurrencies to Bitcoin solely, and are not ready to embrace other blockchain-powered businesses as of now.

U.S. government agencies, on the other hand, have taken a “regulation first, business later” approach, in which overwhelming skepticism has prompted regulators to restrict the potential mainstream applications of blockchain programs utilizing

cryptocurrency. U.S. regulatory agencies have had some of the most controversial regulatory discussions about the future of the space, especially with regard to security-related topics. The U.S. Securities and Exchange Commission has mandated that cryptocurrencies will be considered “assets” under governmental purview, deterring many major international crypto-companies from wanting to operate in America.

II. How ASEAN should look into regulating the decentralized technology

The current state of regulation around the world in the cryptocurrency and blockchain space has attracted a melting pot of perspectives that have left many limbo as to which governance structure to follow. With an uncertain road ahead, a unified regulatory framework for blockchain and cryptocurrency will be crucial to utilizing these exciting technologies to their full potential.

In the pursuit of advancement in our commercial ecosystem, blockchain is the next frontier. By providing immutability and decentralization to traditional exchanges, we can ensure that security will never again come at the expense of efficiency, and vice-versa.

Up until now, it might as if there is less unity rather than friction between regulatory bodies and business experts about how the space should develop. However, in the very near future, this is all expected to change, as blockchain becomes internationally recognized as an essential technology for companies seeking to connect the dots in an increasingly globalized world.

As we can see in the survey the ASEAN states have shifted its stance on the blockchain technology. We see a big shift in the important of blockchain in the ICT Master plan since 2015-2020 (Figure 2) period where 33% did not consider blockchain in strategy and 67% consider as not top 5 priority. We see the huge shift in 2020-2025 master plan that 30% see as critical to its strategy while 50% start to see the important. Looking further in the vision we see that all country no doubt will consider blockchain

into the strategy while 43% take it very critically that it must be in ICT strategy. This means that it's a question of how to really regulate blockchain rather than when AMS should.

	Previous ICT Master plan 2015-2020	Current ICT Master plan 2020-2025	Future ICT Master Plan 2025-2030 (Vision)
1. Critical and in our top-five strategic priorities	0%	30%	43%
2. Important but not in our top-five strategic priority	67%	50%	57%
3. Relevant, but not a strategic priority	33%	10%	0%
4. Haven't reached a conclusion	0%	10%	0%
5. Not be relevant	0%	0%	0%

Figure 2: Importance of blockchain in ICT strategy of AMS in each period

The recognition of blockchain into the ICT strategy of each ASEAN Member States also reflect in the opinion of top management (Figure 3). The survey shows that the top management in each member state see blockchain as an integral parts of their strategy high confident 4.11 average; while it's backed up by the idea that blockchain will achieve its main stream in the near future 4.22 corresponding to the believe that blockchain is no longer an overhype 2.89

The majority also believe that the private sector and NGO involvement with government twill add more value to the development of blockchain 4.00 where there's a general agreement that organization will lose its competitive advantage if not involve the blockchain.

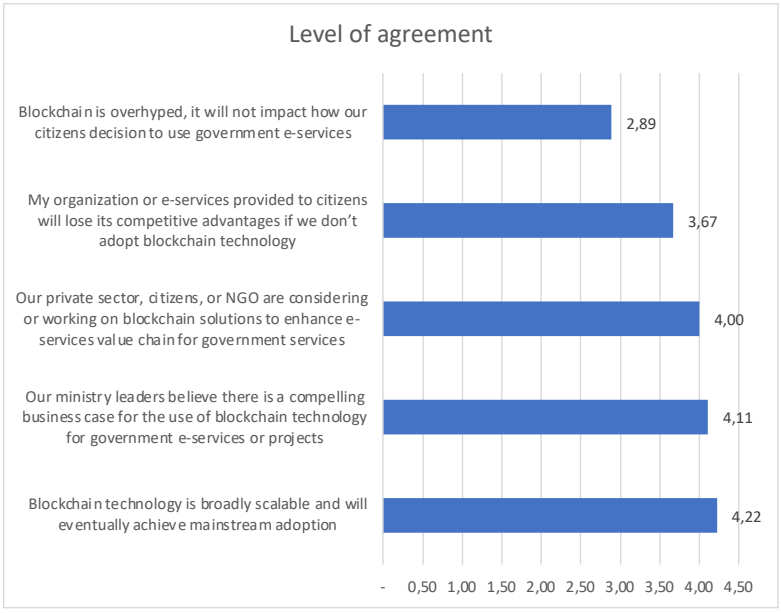


Figure 3 : AMS's attitudes toward blockchain and its adoption

Given that more than 80% of AMS still in early phase of blockchain adoption (Figure 4); The regulating part is in more progressing stage where 56% claiming to have committee from public and private sector to look into the issue or having dedicate team drafting the blockchain standard. Nonetheless, the already existing standard as such IEEE and W3C standard are not yet while adopted

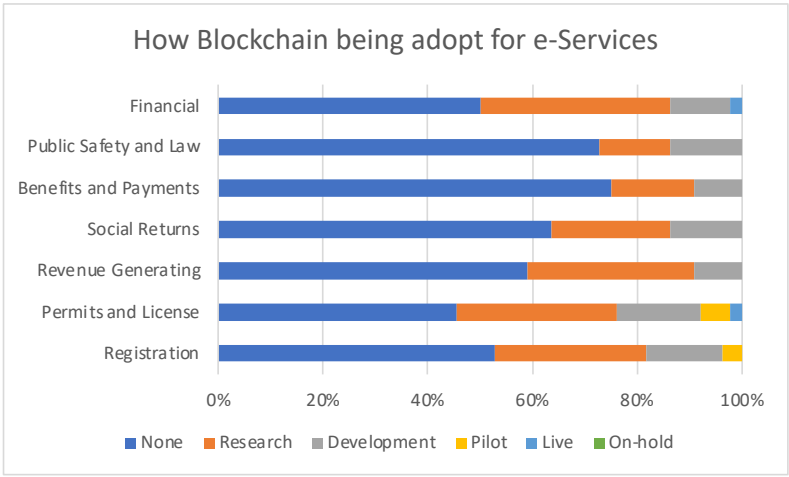


Figure 4: How Blockchain being adopted for e-Services

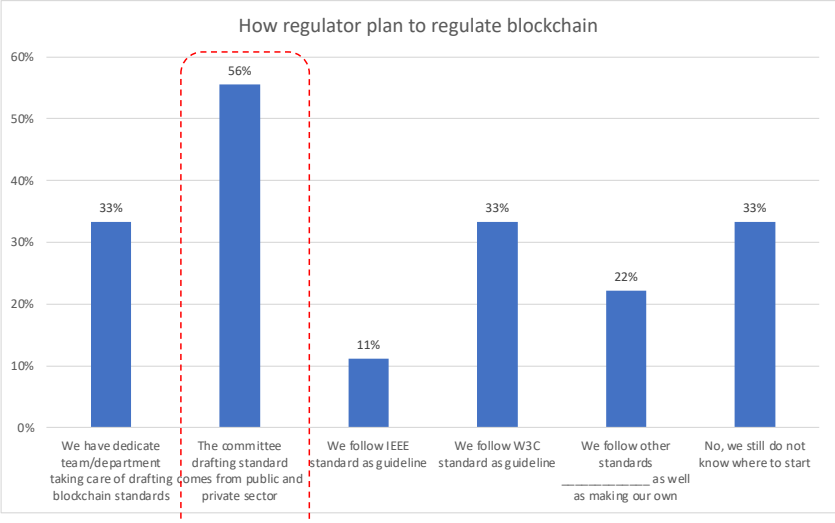


Figure 5: AMS plan to regulate blockchain

III. AMS regulatory tools to handle surging blockchain technology

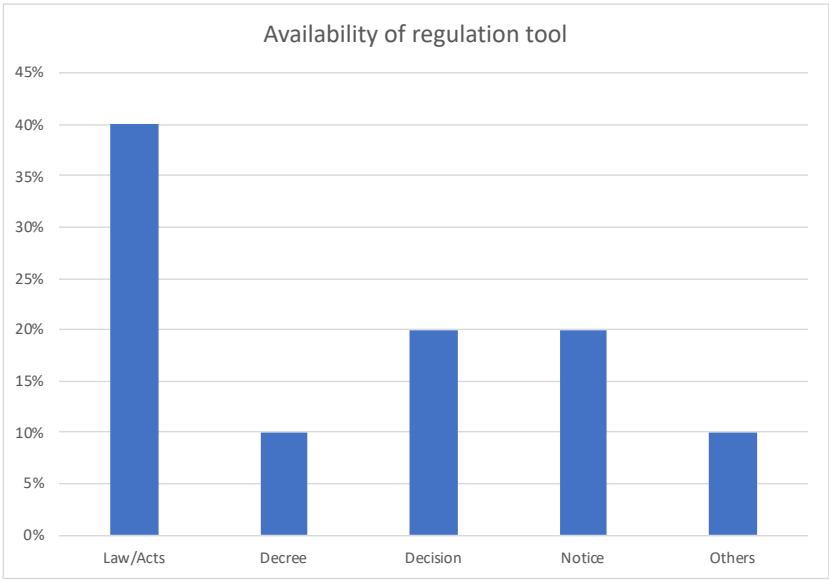


Figure 6: AMS regulatory tools

The regulations toward blockchain technology is still very low with less than 40% of ASEAN members has law related to blockchain for at some sort let alone other type of regulation tool as such decree, decision and notice with less than 20%

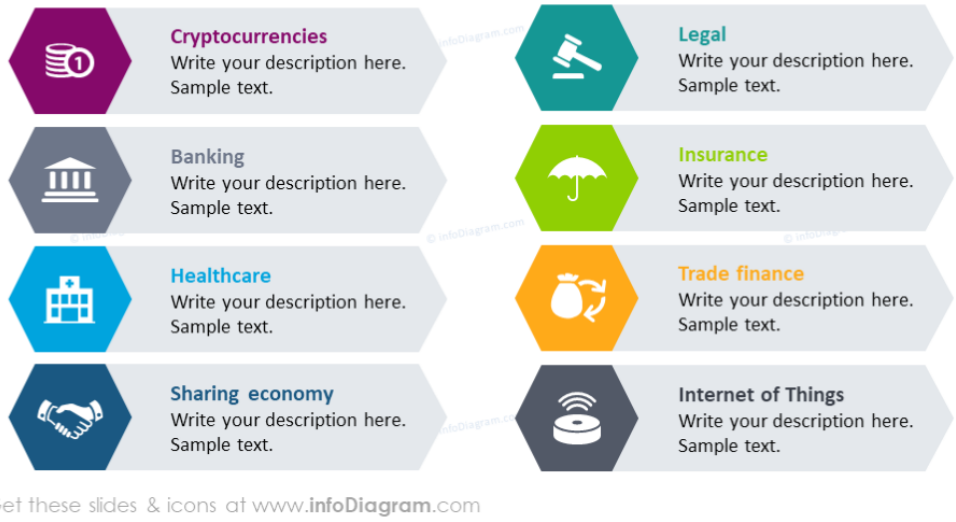
	Thailand	Malaysia	Singapore	Vietnam	Indonesia	Lao	Mynmar	Philiphines	Brunei	Cambodia
Law/Acts	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
Decree	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
Decision	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗
Notice	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗
Others	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓

Chapter 4: Current Status of block chain development and road map

I. ASEAN Blockchain Technology in ICT Master Plan

This section discusses on how government of ASEAN countries prioritize blockchain technology and what are current application of blockchain technology. There are 8 areas of blockchain application including cyptocurrencies, legal, banking, insurance, healthcare, trade finance, sharing economy and internet of thing that have been investigated in this section.

Figure 4.1 List of blockchain application area



Many ASEAN countries have included and prioritized the blockchain technology current ICT Master Plan 2020-2025. Indonesia and Malaysia shifted the blockchain technology from important to critical and in top-five strategic priority of ITC Master Plan 2020-2025. Thailand also put the blockchain technology in the top-five strategic priority of ITC Master Plan.

1. Brunei

The government of Brunei Darussalam realize the important of improving the government services through the digital technology to increase security and convenience for the citizens. The government ministries and institutions provide

access of services requiring the use of digital identity to all public and private sectors (Monetary Authority of Singapore, 2021).

Brunei has not yet adopted blockchain technology into financial service. Central Bank of Brunei issued little guidance on cryptocurrencies other than to warn the public of its risks the public that “cryptocurrencies are not legal tender in Brunei Darussalam and are not regulated by AMBD,” and advising the public “to be vigilant and exercise extreme caution when dealing with such currencies that are privately issued” (Autoriti Monetari Brunei Darussalam, 2017).

2. Cambodia

Cambodia has planned to digitize both the government and the broader economy aim at enabling digital government service delivery. The government of Cambodia also intends to improve social and financial inclusion and participation, stimulate growth in e-commerce, increase security and law enforcement and enhance collection of taxes. In the longer term, infrastructure will be installed for a range of public and private services (Monetary Authority of Singapore, 2021).

Cambodia is one of the first country in the world to launch central bank digital currency which is the backbone of digital payment. The central bank of Cambodia launched the project namely Bakong. It was developed from the collaboration between the National Bank of Cambodia and the Japanese blockchain company SORAMITSU using Hyperledger Iroha technology. One of the main purposes was to foster the use of the local currency while reducing the use of the US dollar (Nagumo, 2021).

Cambodia did not include the blockchain technology ICT Master Plan 2015-2020. However, Cambodia realized the important of the blockchain technology but not in the top-five strategic priorities in the ITC master plan 2020-2025 as well as the future ICT Master Plan 2025-2030. Currently, Cambodia has a policy framework on digital economy and society 2021-2035 and drafts a policy framework on digital government 2021-2035. The government believed that blockchain technology will bring efficiency, transparency, security and trust to a transactional system.

3. Indonesia

Indonesia has recently been following in the footsteps of its close neighbor and business partner, Singapore, in exploring the use of blockchain technology. The country’s Central Bank, Bank Indonesia, has been considering the issuing of a digital

rupiah, the national fiat currency. It is conducting a two-year study assessing the impact a CBDC would have, such as lower operational and transaction costs, especially in remote areas where the distribution of physical money is burdened by infrastructure troubles. The study is expected to be concluded in 2020 and will include an examination of the currency's implications, impacts, procedures, consumer protection, legality, and technology.

4. Lao PDR

The government of Lao PDR has realized the important of e-government in the ICT master plan 2020-2025 but not in the top-five strategic priority. The Law on Electronic Signature in 2018 was the first law to support e-government which is the foundation of e-government service. However, blockchain technology has not yet implement in any government service.

The Ministry of Technology and Communications, Lao PDR has issued the Digital Property Business Pilot Decision No. 888 /MOTC, dated 9 November 2021, stipulating the types, regulations, and measures for conducting digital asset transactions in Lao PDR to ensure the safety, reliability and efficiency of the business. The agreement contains 17 articles that set out the standards and conditions of cryptocurrency operators, including the rules for approving cryptocurrency transactions, the regulations for approving cryptocurrency transactions, the prohibitions for digital asset operators, and more.

The government of Lao PDR has authorized six companies to trade and mine cryptocurrencies while relevant ministries are to draft regulations governing their use. According to a notice issued by the Prime Minister's Office, six companies have been authorized to trial mining and trading cryptocurrencies such as Bitcoin, Ethereum, and Litecoin (Thanabouasy, 2021).

5. Singapore

Singapore is the leading country in technology development in ASEAN. The government agencies of Singapore invested SGD 12 million in the research program for blockchain technology in 2020. The program call Singapore Blockchain Innovation Program (SBIP) which is a collaboration between Enterprise Singapore, InfoComm Media Development authority and National Research Foundation Singapore and this

program was supported by Monetary Authority of Singapore, central bank of Singapore and financial regulator (Monetary Authority of Singapore, 2021).

Blockchain technology is relevant but not in a strategic priority in ITC Master Plan 2015 to 2020 of Singapore. The country realized the important of the blockchain technology but not in the top-five strategic priorities in the ICT Master Plan 2015 to 2020. Main reasons for adopting blockchain technology in ICT Master Plan to enhanced security by storing data on distributed ledgers, to create digital documents that are verifiable and tamper proof, to decentralize self-service verification, to allow for existing manpower to be reallocated to other areas of need and to increase transparency that public listing of transactions that have taken place, and yet not revealing the details within each transaction.

6. Thailand

The idea of applying blockchain technology to upgrade the Thai government into a digital government with integration among intelligent departments to provide service for people. This concept is consistent with the vision of digital government development plan of Thailand. To becoming a digital government as the intended vision must remain 4 actions namely Government Integration, Smart Operation, Citizen-Centric Services and Driven Transformation. However, blockchain technology was not prioritized in the ITC Master Plan 2015 to 2020 (Digital Government Development Agency, 2019).

Thailand put the blockchain technology in the top-five strategic priority of ITC Master Plan 2021-2025. Main reason for adopting blockchain technology on current ICT Master Plan because blockchain is new infrastructure technology that leverages the usage of decentralized architecture design. Such technology has potentially conveyed the efficiencies in the areas of security, availability and implementation and operation IT cost. In addition, blockchain technology is able to enhance potential value added to build the country's competitiveness from large scale to small scale business and all sectors such as manufacturing, financial and banking, agriculture and the likes.

Private sector in Thailand plays a key role in ICT innovation initiatives. Both enterprises and startups have worked collaboratively with public agencies to define the directions of national ICT Master Plan by being members of several key ICT related committees and working groups.

In term of laws, acts, decision and regulations which relate to blockchain technology, Thailand drafted Electronic Transactions Act – Electronic Transferable Records comply with UNCITRAL Model Law on Electronic Transferable Records.

7. Malaysia

Efforts from the Malaysia government to apply blockchain technology started in 2015, with Securities Commission (SC) and Bank Negara Malaysia (BNM) undertaking the key roles as movement on blockchain. This initiative was primarily directed to the financial system via fintech development.

Malaysia Industry-Government Group for High Technology (MIGHT) focuses on blockchain technology for its many attributes to the 4th Industrial Revolution as highlighted by the World Economic Forum. MIGHT's initial efforts to introduce this technology to the market and public in 2016 led to the launched of events, namely an engagement with Andreas Antonopoulus and the Kuala Lumpur Blockchain Conference in 2017.

Efforts involving this technology has increased substantially in 2019. This industry-led initiatives are backed by blockchain "communities" (responsible in the development of bitcoin core, Ethereum, NEM, NEO, etc.) and government officials and agencies. MIGHT, MIMOS, Ministry of Education and Ministry of Health amongst other, have engaged both local and global players at the international platforms to be involved in exploring the technology via Proof-of-Concept approach.

According to the response from survey, Malaysia prioritized the blockchain technology in the ICT Master plan 2015 to 2020 but not in the top-five strategic priority. The ITC master plan 2020-2025 of Malaysia has been significantly changed as the blockchain technology become critical and in top five strategic plan.

II. Perception of AMS toward Blockchain Technology

This section discusses on the attitude of the experts from ASEAN countries on blockchain technology. The scale of attitude ranges from 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is neutral, 4 is agree and 5 is strongly agree on a sentence.

Table 1 shows the attitude of experts on the blockchain technology. On average experts from ASEAN strongly agree that blockchain technology is broadly scalable

and will achieve mainstream adoption. They agree that ministry leaders believe there is a compelling business case for the use of technology for government e-service, private sector, citizen, or NGOs are considering or working on block chain solutions to enhance e-service value chain for government services and the organization or e-services provided to citizens will lose its competitive advantages if they do not adopt blockchain technology. Experts have neutral attitude that blockchain is overhyped and it will not impact how their citizens decision to use government e-service.

Table 1: AMS' Attitude on Blockchain Technology

Description	Average score
Blockchain technology is broadly scalable and will eventually achieve mainstream adoption	4.22
Our ministry leaders believe there is a compelling business case for the use of blockchain technology for government e-services or projects	4.11
Our private sector, citizens, or NGO are considering or working on blockchain solutions to enhance e-services value chain for government services	4.00
My organization or e-services provided to citizens will lose its competitive advantages if we don't adopt blockchain technology	3.67
Blockchain is overhyped, it will not impact how our citizens decision to use government e-services	2.89

The experts also evaluated the roadblocks for blockchain adoption in government e-services. On average they agree that regulatory uncertainty ability to bring network together, benefit silo development of blockchain network across ministries, and audit/compliance concern are the main barrier for blockchain development. Expert neither agree or disagree that lack of trust among users, inability to scale and intellectual property concerns are main obstacles of blockchain development in government e-service.

Table 2: Roadblocks for blockchain adoption in government e-services

Description	Average score
Regulatory uncertainty	3.8
Lack of trust among users	3.3
Ability to bring network together	3.6
Silo development of blockchain network across ministries	3.6
Inability to scale	3.0
Intellectual property concerns	3.0
Audit / Compliance concerns	3.5

Experts also assess five areas of e-service with blockchain technology including registration, revenue generating, social return, benefits and payment, public safety and law and financial. There are five level on application of e-service with blockchain technology including none, research, development, pilot and live (See Table 2).

In term of registration, Indonesia is leader in process of development public identifications and property title. Singapore has a pilot project on property titles and develops the registration of new business by using blockchain technology. Thailand is in the development process on birth, marriage and death certification by using blockchain technology. Lao PDR, Myanmar and Cambodia are not yet applied blockchain technology on registration service.

Singapore already implemented blockchain technology the enrolment of education certified and professional certificated. In addition, work permit and customs declaration of goods, logistics facilitation and quarantines are in the pilot project of implementation. Indonesia is in the process to develop work permit and license by using blockchain technology in all areas. Thailand has a pilot project for blockchain technology on the enrolment of education certified and professional certificated. Lao PDR and Cambodia are on research on permits and licenses.

Only Indonesia has developed the revenue generating in the area of online import and export payment and taxation and government contract and tenders while

Thailand, Malaysia and Lao PDR are doing research in this area. Indonesia is a leader in term of implement blockchain technology to develop social returns, benefits and payment, public safety and law and financial. Cambodia implemented the remittance system by using blockchain technology. Myanmar has not yet applied any blockchain technology for all area of government e-service.

Table 3: e-service with blockchain technology

e-Services with Blockchain technology		Thailand	Malaysia	Singapore	Vietnam	Indonesia	Lao PDR	Myanmar	Cambodia
Registration	Public Identification Document / Profile Record								
	Birth / Marriage / Death Certification								
	Registration of new business								
	Vehicle Registration								
	Property titles								
Permits and License	Passport / Travel Document / VISA								
	Work Permit								
	Announce of Movement / Migration / Immigration								
	Medical Certificate and Medical Records								
	Driver License								
	Enrolment of Education and Education Certified								
	Professional Certification								
	Customs Declaration of Goods, Logistic Facilitation and Quarantines								

e-Services with Blockchain technology		Thailand	Malaysia	Singapore	Vietnam	Indonesia	Lao PDR	Myanmar	Cambodia
Revenue Generating	Online Import / Export Payment and Taxation								
	Government contracts and tenders								
Social Returns	Education Grants								
	Open Public Data								
Benefits and Payments	Migrants, refugees and visitors								
	People with disability								
	Veterans								
	Social Security								
Public Safety and Law	Complaints								
	Consumer protection								
Financial	Digital currency								
	Private shares								
	Insurance								
	Remittance								

None	
Research	
Developmen	
Pilot	
Live	

Table 4 show the experts attitudes on the application of the blockchain regulation including blockchain standard, standard from public and private sector, IEEE standard, W3C standard, another standard. Thailand has planned to draft blockchain standard and the committee who draft a standard are from public and private sector. Thailand also refer IEEs, W3C and ISO standard as guideline. Vietnam set a team and department to draft blockchain stand and follow all standard. Malaysia

and Myanmar still do not know where to start. Singapore follow W3C standard and make their own standard.

Table 4: Regulation on blockchain

Descriptions	Thailand	Malaysia	Singapore	Vietnam	Indonesia	Lao PDR	Myanmar	Cambodia
We have dedicated team/department taking care of drafting blockchain standards	√	x	x	√	x	√	x	x
The committee drafting standard comes from public and private sector	√	x	x	x	√	√	x	√
We follow IEEE standard as guideline	x	x	x	√	x	x	x	x
We follow W3C standard as guideline	√	x	√	√	x	x	x	x
We follow other standards _____ as well as making our own	√	x	√	√	x	√	x	x
No, we still do not know where to start	x	√	x	x	x	x	√	x

Experts provide comments on how suitable of application of blockchain technology for government e-service. The scale of attitude ranges from 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is neutral, 4 is agree and 5 is strongly agree on a sentence.

The average score the attitude of expert on application of blockchain technology for government's e-service is in between 3.78 and 4.22. This means they agree and strongly agree on legal enforcements, legislation records, bills and payments, welfare distribution, digitized ID, healthcare, cyber protection, security and safety and taxation. However, Thailand and Malaysia disagree on legal enforcement that government scan use public blockchain data to monitor transaction to facilitate

legal transaction and stop money laundering. Expert from Malaysia disagree on legislation records that governments can keep a record of all the legislation reports in a better way and disagree on cyber protection that government can use blockchain technology to protection vital Government infrastructure against cyberattacks and hacks.

Table 5: Application of blockchain technology

Description	Average score
Legal Enforcements (Public Safety and Law): Government scan use Public Blockchain data to monitor transaction to facilitate legal transaction and stop money laundering	3.56
Legislation Records (Registration): With decentralized ledger, Governments can keep a record of all the legislation reports in a better way	3.89
Bills and Payments (Revenue Generating): Governments can impose blockchain technology to improve the traditional billing and payment system	4.11
Welfare Distribution (Benefits and Payments): Blockchain technology can be a great way to cut off system losses which will pay the way for better welfare distribution	3.89
Digitized IDs (Permits and License): with decentralized ledger, Government can implement digital IDs for the citizens	3.89
Healthcare: Government can improve healthcare services by utilizing distributed legers	4.22
Cyber Protection: Government can use blockchain technology to protection vital Government infrastructure against cyber-attacks and hacks	3.78
Security & Safety with blockchain technology Government can provide better social security against online frauds	3.89
Taxation: with decentralized ledger, Government can foster better transparency solving tax issue	3.89

Experts have comment on the main challenges and the needs for improvement of the implication of blockchain technology in the areas of legislation, policy, infrastructure, and resources.

Legislation: with in the countries there is no legislation on blockchain and lack of awareness in policy and decision makers. Drafting and enactment of legislations for ASEAN blockchain require the collaboration from multiple countries and parties usually takes a long time. Hence, this process delays the implementation of applications which are blockchain ready as they can only be implemented when the corresponding legislations are in-force. The needs for improvement on blockchain legislation include:

- Engage stakeholders both public and private sectors to participate in framing the regulations.
- Set up a research centers to orient and come up with implementation plans to bring blockchain applications into fields, promulgate appropriate guidelines, policies and legal regulations to promote and control blockchain technology.
- Coordinate with relevant ministries and sectors to organize research, develop plans and roadmaps for blockchain technology application development.
- Support the development of blockchain technology applications through national science and technology programs.
- Prioritize supporting start-ups to implement projects with blockchain technology
- Build the capacity for policy and decision makers

Policy: main challenge on policy implication of blockchain are lacking of entrust and the stakeholder to understand the technology and providing a good direction on policies and guidelines. The silo organization delay the development of policy. The needs of improvement on policy for blockchain is to establish a secure blockchain framework and make it friendly use to both public and private users including people in the country. There should be the master plan (road map) for national DTL initiative that define the official national blockchain/DLT networks instead of having each ministry setting up its own DLT network.

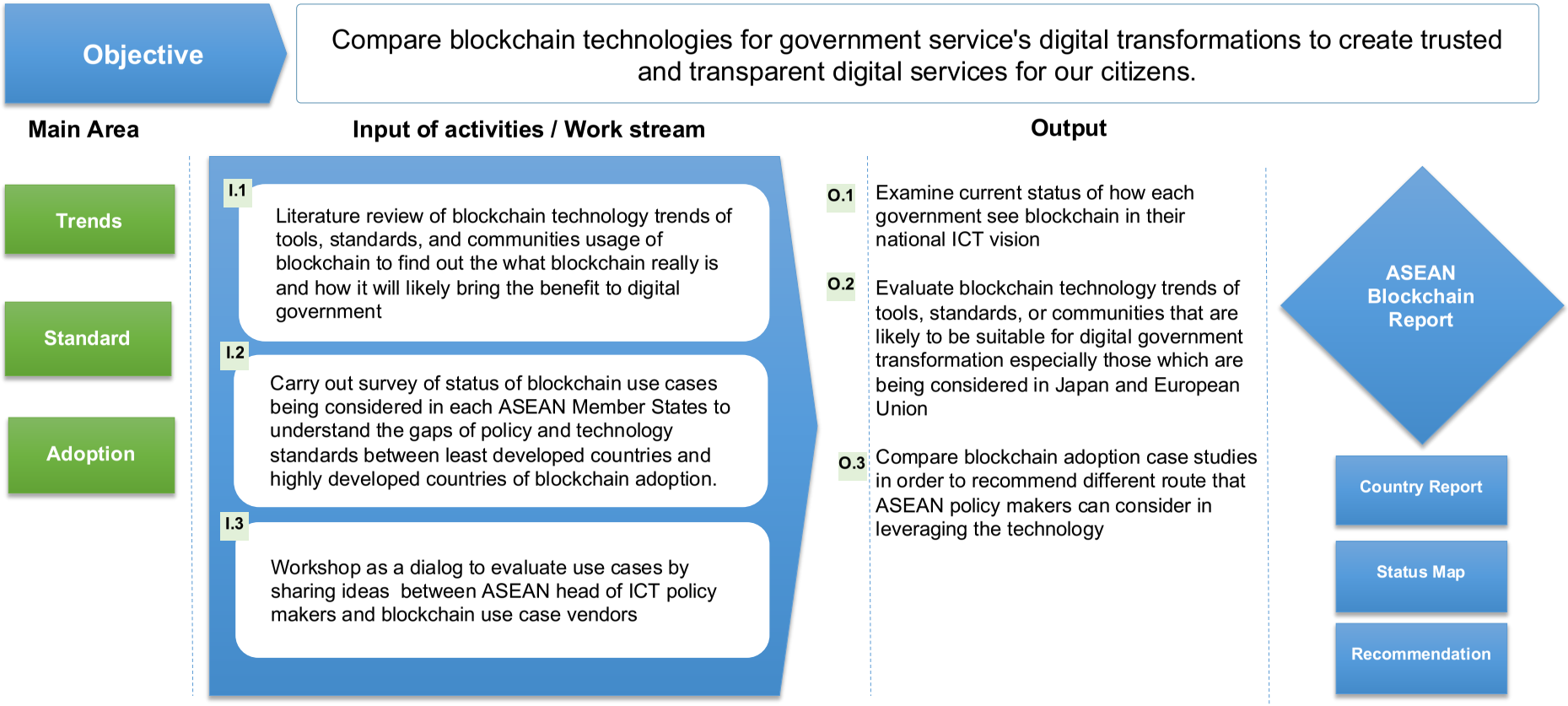
Infrastructure (ICT): One of the main challenges is to persuade the government to invest more on blockchain technology. Some infrastructure is already in placed but there is lack of people to onboard the operational and maintenance. There are need some pilot project of blockchain in the private sector, the public at large, people at all

levels have access and knowledge about blockchain. In addition, it needs to make use of the current infrastructure and coordination on the technology.

Resources (personal, budget.): Lacking skilled labors in blockchain/DLT technologies, i.e., developers, auditors, is the main challenge for blockchain development. In addition, initial costs for data integration and synchronization of all stakeholders are relatively expensive. The blockchain development requires the alignment in human resource improvement among relevant ministries, e.g., ministry of education, ministry of science, research and innovation institute, ministry of labor and the likes.

Chapter 5: Conclusion & Recommendations

I. Methodology



Conclusion & Recommendation

Objective

Compare blockchain technologies for government service's digital transformations to create trusted and transparent digital services for our citizens.

Output		Initial Finding		Recommendations	
O.1	Examine current status of how each government see blockchain in their national ICT vision	F.1	Blockchain has become more important to AMS ICT Master plan 2020-2025 where top management see it as integral part of the upcoming strategy and the technology itself is becoming mainstream	R.1	AMS should set up working group to share ideas how to govern the blockchain
		F.2	Majority of AMS agree that private sector should involve in the blockchain technology development for e-services	R.2	AMS should streamline the involvement of private and public sector in order to accelerate the policy development
O.2	Evaluate blockchain technology trends of tools, standards, or communities that are likely to be suitable for digital government transformation especially those which are being considered in Japan and European Union	F.4	AMS in general agreement that blockchain is suitable technology for e-services	R.3	Shared infrastructure can help optimize scared resource. The AMS blockchain network might provide stepping stone for ASEAN blockchain and help stabilize the fees
		F.6	The understanding of technology amongst AMS regulator remain very low; human resources are needed to assist regulators	R.4	Least developed countries, Cambodia, Lao PDR and Myanmar, have limited budget to develop ecosystem for blockchain
O.3	Compare blockchain adoption case studies in order to recommend different route that ASEAN policy makers can consider in leveraging the technology	F.7	The adoption of blockchain technology for government e-services remain very low with only less than 5% of the project live	R.5	Human resource improvement among relevant ministries
		F.3	The regulating part is in more progressing stage where 56% claiming to have committee from public and private sector to look into the issue or having dedicate team drafting the blockchain standard and regulation		
		F.5	Healthcare, Revenue generating are the key areas where AMS believe blockchain can be most beneficial. Nonetheless, AMS do not believe that it will solve legal enforcement issues		
		F.8	Each continent adopt different approach in embracing the technologies. It's boiled down to 3 major "right to be forgotten", "business first, regulation later", "regulation first, business later"		

Chapter 6: Summary of the Workshop.

E-Government Center, Ministry of Technology and Communications (MTC) of Lao PDR, hosted the online workshop on "**Blockchain for digital government – the ASEAN way**" on the 13th October 2021. The online workshop was participated by 6 ASEAN Member States (AMS), except the Philippines, Brunei, Singapore and Cambodia and staff members of the ASEAN Secretariat (ASEC) as well as local agency from line ministry of Lao PDR. Total number of participant 73 person, the list of participants appears as Figure 8

The workshop was chaired by **Dr.Thavisak Manodham**, Director General of E-Government Center, MTC, Lao PDR. During his opening remark he has thank you AMS and Lao delegation who take their time to participate and contribute to this workshop despite difficulty from covid 19. He then presented the objectives of the workshop are 1) to review and evaluate current status of Block chain technology among ASEAN member countries including policy, regulation, usage, management and development and 2) evaluate use cases by sharing ideas between ASEAN ICT policy makers and blockchain use case vendors. And 3) Discussion on how policy maker /regulator can promote the technology for blockchain adoption for ASEAN

I. The Workshop Agenda

Time (Lao time)	Description
8:30 – 09:00	**Registration**
09:00 – 09:10	**Opening Session: Welcome Remarks** - Director General of E-Government Center, Ministry of Technology and Communications
09:15 – 09:30	**Project Brief**

	- Director , E-Government Center, Ministry of Technology and Communications
09:30 - 10:00	**Project Preliminary Finding** - Project Overview - Presentation on Summary of Pre-Questionnaire analysis - by Mr. Anoloth PHANVONGSA – Project consultant
10:00 - 10:50	**Session 1: Country Report from Representatives from ASEAN MEMBER STATES.** This session will introduce and share status of blockchain use cases being considered in each ASEAN Member States to understand the gaps of policy and technology standards as well as blockchain adoption. Each country representative will present their country update (5 mins each).
10:50- 11:55	**Group photo (online then Offline)**
10:55 - 11:20	**Session2 : Keynote speaker from FINEMA (Thailand);** **Blockchain Technology and its adoption** - Presentation from Mr.Piya YUENYONGSUWAN - Q&A
11:20 - 11:50	**Session 3: Keynote speaker LAO IT Dev.Co.Ltd (Lao PDR)** **Blockchain technology and its adoption from developer and SME view** - Presentation from Virasack VIRAVONG - Q&A
11:50 - 12:20	**Session 4:** Discussion / WRAP UP - evaluate use cases by sharing ideas between ASEAN ICT policy makers and blockchaiDsn use case vendors. - how policy maker /regulator can promote the technology for blockchain adoption for ASEAN
12:20- 12:30	**Closing Remarks,** Director General of E-Government Center.
End of the workshop	

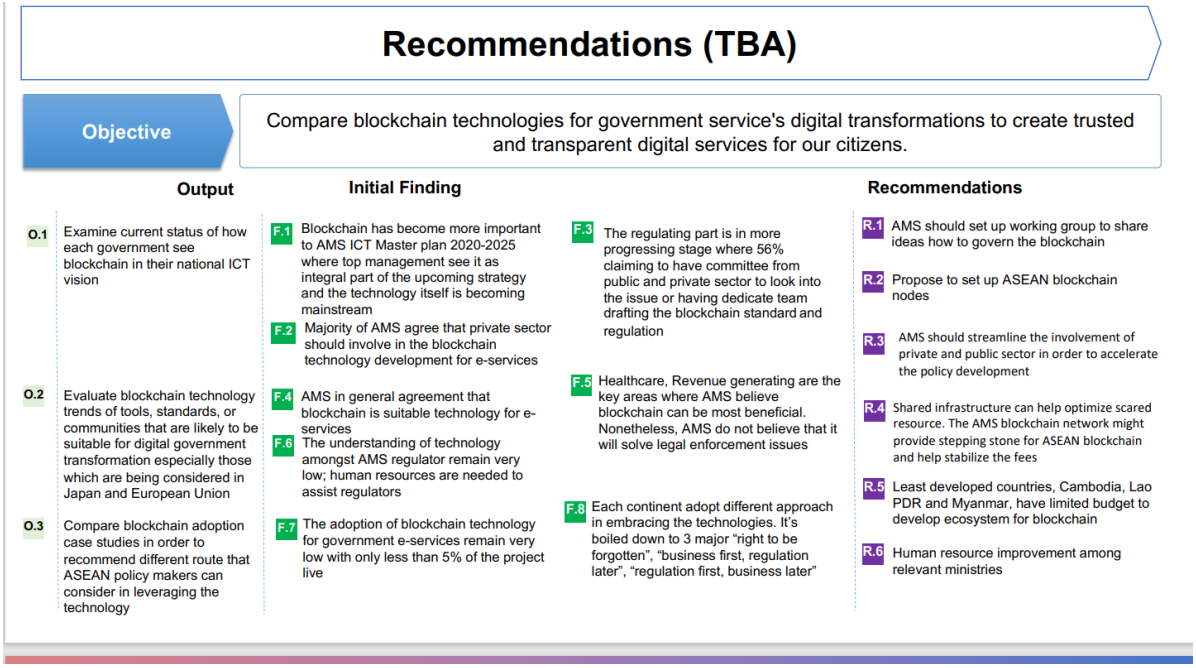
II. Agenda 1. Project Brief

E-government center as project owner has provide introduction and project detail to the workshop as follow: The project aims to compare blockchain technologies for government service's digital transformations to map opportunities, challenges, gaps, and put forward recommendation on how ASEAN states together leverage this upcoming technology to create trusted and transparent digital services. The study shall (1) examine current status of how each government see blockchain in their national ICT vision; (2) evaluate blockchain technology trends of tools, standards, or communities that are likely to be suitable for digital government transformation especially those which are being considered in successful cases (3) compare blockchain adoption case studies in order to recommend different route that ASEAN policy makers can consider in leveraging the technology. The project was in line with the ASEAN ICT Master Plan 2020 on Thrust 2: Digital Transformation Initiative - Emerging technologies (e.g.: AI, IoT, 5G, cloud computing, big data, etc.) and Thrust 3: Resilience, Trust and Security - Addressing risks and threats of emerging technologies and in line with MPAC 2025 strategic objectives: Sustainable infrastructure: increase public and private infrastructure investment in each ASEAN member states, as needed. Where the expected outcome is the final Report composed of the literature review of blockchain technologies, survey data analysis of blockchain technologies being adopted for digital government in AMS, recommendation on possible Roadmap and ASEAN blockchain action plan. The project is now at the final stage of development and expected to complete by the end of 2021.

III. Agenda 2. Project Preliminary Finding

The consultant has provided initial report on the outlook of questionnaire survey to AMS (8 response was received from AMS except Brunei and Philippines). The methodology of the project is to compare blockchain technologies for government services digital transformation to create trusted and transparent digital service for AMS citizens. With 3 Area of focus 1. Trend, 2. Standard and 3. Adoption. The initial report shows the important of Blockchain technology has shifted between each period in the national ICT/ Digital Masterplan and attitude toward blockchain and its adoption. The

majority also believe that the private sector and NGO involvement with government twill add more value to the development of blockchain 4.00 where there's a general agreement that organization will lose its competitive advantage if not involve the blockchain. When it comes to e-government services, the survey has asked the blockchain application or suitability of e-government services, where AMS in general agree that blockchain is suitable for e-government services. The Healthcare and Revenue generating e-services are the areas where AMS strongly believe that blockchain has the role to play. Healthcare score 4.22 the highest where blockchain distributed ledger can health improve how healthcare data is managed while Revenue generating e-services score 4.11. Nonetheless, it's quite surprise that AMS do not believe blockchain can improve the legal enforcements scoring lowest at 3.56. The initial finding also highlight main challenges of blockchain development including Regulator and the government have a lot of work to catch up with the technology resulting in the delay of regal vehicle to regulate. the lack of knowledge, AMS policy remain silos and lack participation from stakeholders either public nor private sector, Performance, Interoperability, network access, Lack of skilled resources leading to unstable operational cost.



IV. Agenda 3. Country Update

Representative from 6 ASEAN Member States participant comprising of Indonesia, Lao PDR, Myanmar, Malaysia, Thailand and Vietnam has updated their country development as follow:

1. Indonesia

Indonesia presented their regulatory and implementation update, the history start from the crypto asset trends with daily transaction value reach 2.3 Trilliant, an increase of 1.178% from 2020 of 180 billion. Where the crypto asset investor reached 7.4 million, 85% increase from 2020 of 4 million people. Association of Blockchain Indonesia (A-B-I) vision is aims to mobilize and organize Blockchain technology actors in creating a quality business environment that spurs the understanding, utilization, progress and competitiveness of Blockchain technology, in conjunction with the 4.0 industry revolution, both at the national and international levels. The presenter also briefs on the journey of how ABI started in 2017 to present, where in 2018 the minister of trade regulation issues the regulation number 99 on crypto as a commodity and in 2019. CoFTRA regulation on crypto asset trading technical procedure in Indonesia was release. Finhack Blockchain innovation was established as the biggest hackathon in southeast Asia by BCA and ABI. In 2020 KBLI for blockchain companies by Ministry of Communication and information was established. National blockchain education event on Indonesian blockchain conference was hosted by ABI. In present year 2021, blockchain council was found as an institution that observe and supervise the blockchain industry in Indonesia. The presenter also touches upon the blockchain and trypot asset landscape version 2.0 which composted of Government bodies and association, exchange and OTC, consulting and development, active protocols, media and information, blockchain project and enablers and lastly community and ecosystem. Overall Indonesia can consider be one of the leading countries in AMS in term of policy, regulation, and ecosystem. Where they have quite a well establish association.

2. Lao PDR

Lao PDR has presented their current development on blockchain with the focus on cryptocurrency and fintech. Currently the countries have already formulated the digital economy masterplan and digital transformation plan, where blockchain technology consider to be one of the upcoming technologies that has great potential in many area of social and economic development. There is still a need on UNCITRAL model law on electronic transferable record (MLETR) into domestic regulation. The presenter from Lao also presented on the use case of cryptocurrency trail program in Lao, on September 2021, the government of Laos has authorize six companies to trade and mine cryptocurrencies while relevant ministries are to draft regulations governing their used including digital asset regulation. The bank of Lao PDR recently signed a memorandum of understanding with Japan international cooperation agency on studying the development of central bank digital currency. Apart from blockchain for finance, in 2020 the feasibility study on building logistic platform using blockchain for efficient management was carried out as part of blockchain adoption in Lao PDR.

3. Myanmar

Representative of information technology and cyber security department of Myanmar has presented their current development on blockchain including the current internet penetration, blockchain use case with their capital market, migrant worker, and local SME and microfinance, smart city project.

On internet subscription, there were 23.65 million internet users in Myanmar in January 2021 and Internet penetration in Myanmar stood at 43.3% in January 2021. Social media statistics for Myanmar. There were 29.00 million social media users in Myanmar in January 2021. The number of social media users in Myanmar was equivalent to 53.1% of the total population in January 2021.

For blockchain got capital market system, in 2016, YSX established cooperation with Tokyo-based Daiwa Securities Group to explore the use of blockchain to support the exchange's operations. Under the cooperation framework, Daiwa's blockchain-based equity trading platform will be integrated with the YSX's exchange platform to facilitate the development of a more efficient bookkeeping system. During the pilot phase of the project, blockchain, which dispenses with the need for a centralized server, enabled the stock exchange to maintain its operations despite the country's

frequent power outages. The presenter has also highlight how blockchain support Myanmar's migrant worker. The Central Bank of Myanmar had in April 2019 officially endorsed the use of blockchain for the national payment system, approving collaboration between Shwe Bank of Myanmar and Krungthai Bank of Thailand to develop a blockchain-based cross-border remittance system between the neighboring countries. Shwe Bank and Krungthai Bank are exploring the use of Bangkok-based Everex's blockchain platform to develop an Ethereum (ETH)-based cross-border remittance system to provide a secure channel through which the 3 million Myanmar migrant workers in Thailand can wire money to their families back home. Another good example brought buy presenter is how blockchain has been adopted by their Local SME on microfinance sector, In 2016, Myanmar became the first country in the world to use blockchain for microfinancing, following a pilot project by Japanese software development firm Infoteria testing the decentralized technology on the computer system of Yangon-based microfinance institution BC Finance. However, major obstacles remain. Infoteria highlighted the problem of blackouts and the "low quality of local circuits," damaging the reliability of the country's internet infrastructure and, therefore, inhibiting further adoption and development of blockchain in the nation.

In term of policy and legal measure

In 2019, the Central Bank of Myanmar issued two warning statements against the use of cryptocurrency. In the first warning statement issued on May 3, 2019, the types of cryptocurrencies that was banned from being traded was not disclosed, but it has been issued as a warning. On May 15, 2020, it issued a statement restricting cryptocurrency transactions and prosecuting violators but did not specify the exact type of penalties. Given the country's past explorations of the technology, Myanmar appears to be a believer in blockchain and its potential. Nonetheless, it continues to struggle with energy insecurity due to the instability of its power grid. The World Bank recommends that Myanmar double investment in its power sector to US$2 billion from 2020 onwards. The country's upcoming smart city, Yatai, presents an ideal opportunity to develop a more stable power grid, paving the way to unlocking blockchain's potential and sustain Myanmar's economic growth

However there are still challenges as such Insufficient in National Infrastructure on electricity and technology, Policy Constraints and Poor Digital Literacy for financial sector

4. Malaysia

The representative from Malaysia has presented country latest development on blockchain where Malaysia is now looking at blockchain technology that include both blockchain and DLT as one, in tandem with the initiative being pursued at ISO level, such as TC 307 (Committee for Blockchain and Distributed Ledger Technology), where Malaysia is one of the founding members. Malaysia has quite an mature ecosystem including fintech regulatory sandbox, industry development and facilitation, standardization body, blockchain DLT applied research, in term of community Malaysia has blockchain DLT hub and talent development program and incubator accelerator. The presenter has brief the meeting on the development timeline from the year 2015 - started with the Securities Commission (SC) and Bank Negara Malaysia (BNM), primarily directed to the financial system via fintech development, in year 2016 - Malaysia set up the National Mirror Committee on Blockchain and DLT.

The presenter has also highlight snapshot of key milestone and pilot project in Malaysia 1. Standard Malaysia: Creation of TC/G/15 National Mirror Committee on Blockchain and DLT and one of Founding members for the global ISO committee for Blockchain and DLT TC307 Blockchain & DLT, 2. Bank of Negara Malaysia is running a proof-of-concept (PoC) project to gauge the merits of central bank digital currency (CBDC) with an initial focus on wholesale CBDCs start from June 2021. 3. Securities Commission (SC) has registered 4 Recognized Market Operators (RMOs) to establish and operate digital asset exchanges (DAX) in Malaysia in July 2021. 4. Bursa Malaysia is utilizing blockchain in a proof-of-concept (PoC) geared towards greater transparency and smoother operations in the securities borrowing and lending (SBL) market in 2019, 5. Malaysia Automotive Institute (MAI) invests RM2m in blockchain tech. 6. Malaysia to use Blockchain for bettering Islamic finance, renewable energy, and palm oil sectors in 2018.

5. Thailand

The representative from electronic transaction development agency from Thailand has presented on the history of how blockchain was started and their current

regulatory and promotion activity. In term of regulation a Digital Asset Act 2018 by Securities and Exchanges Commission (SEC) and Draft of Electronic Transaction Act amendment by Electronic Transactions Development Agency (ETDA) to incorporate Electronic Transferable Record (ETR) based on UNCITRAL Model Law on Electronic Transferable Records (MLETR). In term of promotion, Thailand has carried out several activities including: (1) Technical standard for Verifiable Credentials (VC) and Verifiable Presentations (VP) in accordance with W3C, (2) Technical guideline for Decentralized Key Management System (DKMS), (3) Innovation Testbed by ETDA focusing on Self Sovereign Identity (SSI) model –new approach that individuals can control their Digital IDs, (4) Innovation Sandbox focusing on new technologies that support Digital IDs and e-Document use-cases by several regulators such as ETDA, Bank of Thailand, Revenue department and (5) Blockchain Professional Certification program by Thailand Professional Qualification Institute.

The presenter also highlights the the key principles of MLETR is nondiscrimination against the use of electronic mean, functional equivalence, and technology neutrality. To further explain, the singularity is to prevent the multiple claims to perform the same obligation, prevent unauthorized replication of ETR by the system, require reliable identification of ETR. For the control part, MLETR's control over the electronic transferable record in manner equivalent to physical procession and use of reliable method to identify the person in control of ETR. For Integrity, the information remains complete and unaltered from the time of the creation of ETR until it ceased to have any effect on validity.

The presenter also shows the current existing landscape of blockchain in Thailand including multiple stake holder from different sector across the industry: Digital asset exchange/broker/dealer. ICO portal, Defi, Blockchain development/solution, Network, consortium/association, regulator, Academic and Financial.

Some example of Thailand key blockchain use cased including National Digital ID, blockchain for procure to pay by SCG and digital Venture, Inthanon project by Bank of Thailand, Electronic Letter of Guarantee by BCI, VAT refund for tourist by Revenue department of Thailand, E-vote on blockchain by J-venture and Thaichain foundation

(which is now testing in ETDA's sandbox) and present year Thailand just announce the creation of retail CBDC by band of Thailand on 2022.

6. Vietnam

Representative of Vietnam from ministry of information and communication has presented Vietnam current situation, in term of social interest Blockchain is hot "key word" of technology in last 5 years in Vietnam, where many startups develop products/service based on Blockchain technology. Several blockchain hackathons activities were organized in last 5 years and conferences/workshops/seminars/meetups related to blockchain technology were held in the past year. In term of regulation and direction, the Resolution 52-NQ/TW dated May 27, 2019, of the Politburo on guidelines and policies to actively participate in the fourth industrial revolution (4IR), Decision 749/QD-TTg dated June 30, 2020 of the Prime Minister approving the National Digital Transformation Program to 2025, with a orientation to 2030. Decision No. 942/QD-TTg dated June 15, 2020, of the Prime Minister, Approving the Strategy to develop Digital-Government towards digital government in the period of 2021 - 2025, with a vision to 2030. The presenter also touch on the product and services that being pilot and implemented in the past year including: Agriculture products track and trace, Logistics management, Bank L/C management, eContract/eInvoice management, Identity management; scoring/coupon management and Blockchain-based Games/NFT.

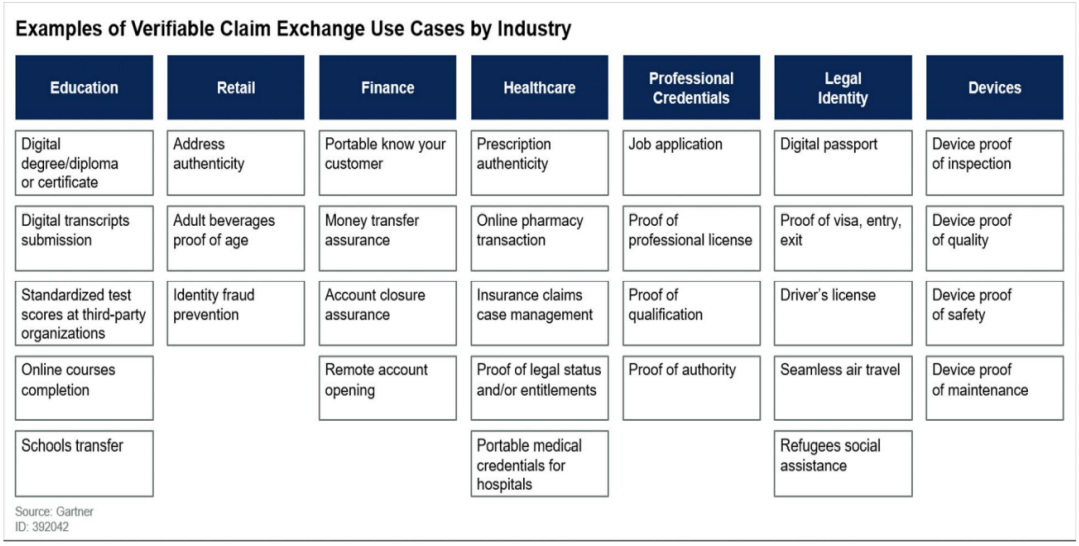
For the next step, the roadmap that Vientiane has set is to building a National Blockchain Development Strategy (roadmap), set Legal framework for applying blockchain in sectors (gov, finance, fintech…), laid policy for blockchain development (blockchain platform, blockchain services…) and set Policy for blockchain adoption in sectors. The are of Human resource development in blockchain and other digital technologies is one of the key highlight and also to ensure Technical standards of blockchain technology is well address.

Participant from Vietnam call for ASEAN collaboration to share experiences of blockchain and their country adoption as well as collaborating in technical standards and interoperability among AMS.

V. Agenda 4. Expert Presentation

1. speaker from FINEMA (Thailand) on Introduction of Blockchain Technology

The expert speaker first introduce what is block chain technology by addressing its definition and share his view that “Blockchain allows any private or public section in the world to securely transact with any other without an intermediary” . he later then explains on how blockchain work by enables trusted interactions between unknown participants by combining five design elements to authenticate users, validate transactions and record that information to the ledger in a way that can’t be corrupted by a single participant or changed after the fact. The speaker shows the evolution of digital identity and benefit of blockchain can be used by digital credential exchanges. The photos below show the example of how blockchain can be used across different industry including education, retail, finance, healthcare, professional, legal and devices.



Examples of Verifiable Claim Exchange Use Cases by Industry

Education	Retail	Finance	Healthcare	Professional Credentials	Legal Identity	Devices
Digital degree/diploma or certificate	Address authenticity	Portable know your customer	Prescription authenticity	Job application	Digital passport	Device proof of inspection
Digital transcripts submission	Adult beverages proof of age	Money transfer assurance	Online pharmacy transaction	Proof of professional license	Proof of visa, entry, exit	Device proof of quality
Standardized test scores at third-party organizations	Identity fraud prevention	Account closure assurance	Insurance claims case management	Proof of qualification	Driver’s license	Device proof of safety
Online courses completion		Remote account opening	Proof of legal status and/or entitlements	Proof of authority	Seamless air travel	Device proof of maintenance
Schools transfer			Portable medical credentials for hospitals		Refugees social assistance	

Source: Gartner
ID: 392042

Figure 7: Example of Verifiable Claim Exchange Use Cases by Industry

Demonstration on the complete system of digital ID using blockchain has been explained and highlighted on data authenticity without contacting the issuer. And can be using attribute-based credentials with zero knowledge proof. He further drives down in technical concept of why digital ID suits and should be applied to blockchain for human being where more trustworthy and respect privacy (Decentralized identified leverage proven cryptographic system) their benefit including trust, security, data integrity, simplicity, privacy and revoke.

Some use cases examples of blockchain from other countries like e-Estonia was 1st notion stat in the world to deploy blockchain technology in production system since 2012, Zug Digital ID decentralize identity Ethereum platform to create the world first live implementation of SSI in 2017. For health pass that is one of the key highlight during the ear of covid 19 Digital Health Certificate needs for cross border, International standard platform, Vaccine type and vaccinated information and Secure and privacy of holder information.

2. Speaker from LAO IT Dev.Co.Ltd (Lao PDR) on Blockchain technology and its adoption from developer and SME view

The invited speaker from Lao IT Dev presented blockchain from the perspective of IT developer and small medium enterprise view. He first asked do we actually need blockchain in our works and business where the key principle of block chain is trust. The flow chart of when to use blockchain has been illustrated with the Yes and No question whether, you might need a permissioned blockchain with medium transaction speed or you might need a public blockchain with slow transaction speed. He has also presented the challenges in blockchain for business and SME as it initial cost might be relatively high, energy consumption is huge, integration with legacy system still pose some difficulty and he also touch on the public perception and understanding of how blockchain works and the important of defining the level of privacy.

For any business to use blockchain he then said it need 3 things, 1. Immutable mean if you put something on blockchain its really hard to change. 2. Distributed mean no one computer can't decide it's a network of computers around the world sharing

that decision and 3. Ledger is just a table that contain a lot of information. The speaker demo how block has been hashing by using andersbrownworth.com.

With the example of use case in Lao PDR is blockchain for finance and the area that is on going pilot is food origin tracking, prevention of raw material alteration, decentralization of companies and IoT control. He then finished off his last presentation slide by commenting that for business and SME who interested to adopt blockchain technology you will first have to understand your business if its really require them and then technology can be apply as second.

VI. Agenda 5. Discussion session and way forward

The meeting has discussed and suggested that government should promote viable policy and regulation for blockchain technology adoption through test bed and sandbox. Currently there is association of ASEAN Blockchain consortium with few AMS as member including Philippines, Singapore, Indonesia, Thailand and Australia. Apart from recommendation to create blockchain policy working group among ASEAN, member state can also take a look into the work of consortium. The workshop also highlights the important of interoperability for future use of blockchain through common technical standard and technology. To wrap up, the workshop has provided insightful understanding what's block chain and its potential and demonstration on concept of blockchain hash function used with the recommendation to business, enterprise who wish to embark on blockchain to first understanding the business first and technology second. the workshop has also view that the next area of cooperation on blockchain technology of ASEAN should focus on digital health pass, digital driver license, and border crossing.

In conclusion, the AMS participant suggested that AMS should continue to share experiences and expertise on blockchain development including policy, regulation and collaboration on technical standard is one of the key agenda for the up coming year. The workshop report has been formulated as part of the final report of the project and subject to circulate for AMS to review for further adoption. Material of the workshop can be found in Figure 8.

VII. List of participant

Workshop on Blockchain for digital government – the ASEAN way

No :	Name and surname	Position	Ministry/Institution
1	ท่าน ส์มสะໜุก ทองสะหงวน	ວິຊາການ	Ministry of Energy and Mine (MEM)
2	ท่าน บ์วจัน สีหาว์ง	ຮອງຫົວໜ້າຫ້ອງການ	Ministry of Agriculture and Forestry (MAF)
3	ดร. ถาวัน ลาดพ์มมะจัน	ຫົວໜ້າພະແນກ ຫ້ອງການ ກະຊວງສາທາລະນະສຸກ	Ministry of Health (MOH)
4	ท่าน ม ภันละยา พ์มมะว์งสา	ວິຊາການ	Ministry of Home Affairs (MoHA)
5	ท่าน ถำอ้วน ปะเสิดสัก	ຫົວໜ້າພະແນກໄອທີ ກະຊວງຍຸຕິທຳ	Ministry of Justice (MoJ)
6	ท่าน สีสะหวันย่ำ หวาไท	ວິຊາການ ໄອທີຫ້ອງການ ກະຊວງ ຖະແຫຼງຂ່າວວັດທະນະທຳ ແລະ ທ່ອງທ່ຽວ	Ministry of Information, Culture and Tourism (MICT)
7	พ.อ ไຊยะสอม แก้วโยที	ຮອງກົມຄົ້ນຄວ້າສັ່ງລວມ, ຫ້ອງວ່າການກະຊວງ	Ministry of Defence (MOD)
8	ท่าน ส์มอุลา ยะพิจิด	ຫ້ອງການ ກະຊວງ	Ministry of Natural Resource and Environment (MOE)
9	ท่าน ปอ. บุนทัน บุนวิไล	ຮອງເລຂາທິການສະພາແຫ່ງຊາດ (ສະເໜີເລຂາເຂົ້າຮ່ວມບັນທຶກນຳ)	National Assembly (NA)
10	ท่าน พอนไຊ วิไลทอง	ຮອງຫົວໜ້າ ກົມປະຊາສຳພັນ	Prime Minister's Office (PMO)
11	ท่าน เพ็ดสะໝอน พันทะว์ง	ຮອງຫົວໜ້າຫ້ອງການວ່າການສຳນັກງານປະທານປະເທດ	President's Office
12	ท่าน ปอ วันทอง นาทกะเสม	ຮອງກົມຄົ້ນຄວ້າສັ່ງລວມ	
13	ท่าน จิ่ง ล่ำ	ຮອງຫົວໜ້າພະແນກໄອທີ	
14	ท่าน ไຊยะสิด ยอยสายถำ	ຮອງຫົວໜ້າພະແນກ ສະພາການຄ້າ ແລະ ອຸດສາຫະກຳ ແຫ່ງຊາດ ລາວ	Lao Trade Union
15	ท่าน ม. สุนิพา เดดว์งสา	ສະມາຄົມ ການຄ້າໄອຊີທີລາວ	
16	ท่าน ม อาลุนไຊ แก้วลาวัน		Lao Women's Union (LWU)
17	ท่าน สอนไຊ ภว้างมะนิวัน	ວິຊາການ ຈາກສູນກາງສະຫະພັນກຳມະບານລາວ	Lao National Chamber of Commerce and Industry
18	ท่าน ม วรุงสอน		LaoSAT
19	ท่าน สุพ์ม จันทะวิไຊ	ผู้อำนวยการใหญ่	LTC
20	ท่าน ดาวถำ ลໍถำ	ผู้อำนวยการบ์ลิสัด ดิจิต้อม ฟิมเท้ก	ETL
21	ท่าน ไຊสุวัน สีพอนไຊ	ຮອງອຳນວຍການ ສູນສະຫນອງເຕັກໂນໂລຢີ ຂໍ້ມູນຂ່າວສານ	Unitel
22	ท่าน ม. มะโนลิ เถมาว์ง	ผู้อำนวยการ	Planet
23	ท่าน สุพ์ม พูมสะหวัด	ຮອງຜູ້ອຳນວຍການ ບໍລິສັດ ພລາເນັດ	
24	ท่าน ม. สุนิพา เดดว์งสา	ຮອງເລຂາທິການສະມາຄົມ	LICA
25	ท้าว ม์วกุ ภาวเจิปาว	CTO ຂອງ ບໍລິສັດ ลายลาวแล็บ ไอซีทิ โซลูเชิ่น จำกัด	ลายลาวแล็บ
26	ท่าน ม สัมสะนิ เพิมมะสาน สัก	ຮອງຫົວໜ້າພະແນກ ສັງລວມ ຫ້ອງການ ທຫລ	ทะนาคานแห่งชาด
27	Ms Manivanh Phomphengme	ຮອງຫົວໜ້າພະແນກນິຕິກຳ, ກົມບັນຊີ	กะซวงกานเงิน
28	ท่าน อุ่นเรือน ลัดตะมะ	ວິຊາການ	กะซวง อุดสาหะกำ และ กานค้า

29	Mr. Virasack Viravong	Co-Founder/CEO	Lao ITDEV
30	Mr. Chanthachone		
31	Mr. Chanthajohn		
32	Mr. Saichai Lee		
33	Mr. Soulivong Oudomxay		
34	ທ່ານ ຈັນທະວີພອນ	ຮອງຫົວໜ້າ ກົມຈັດຕັ້ງເຂົ້າຮ່ວມ	ກົມຈັດຕັ້ງ-ພະນັກງານ
35	ທ່ານ ຈັນທະຈອນ ອັກຄະວົງ	ຮອງຫົວໜ້າພະແນກ	ກົມຄຶ້ນຄວາມຖິ່
36	ທ່ານ ປະສິດທິເດດ ຫຼວງວິໄລ	ຫົວໜ້າສູນຂໍ້ມູນດິຈິຕ໋ອນ	ກົມເຕັກໂນໂລຊີດິຈິຕອນ
37	ທ່ານ ຂວັນເທວາ ພົນເສນາ	ວິຊາການ	ສະຖາບັນເຕັກໂນໂລຊີຄອມພິວເຕີ ແລະ ເອເລັກໂຕຣນິກ
38	ທ່ານ ພວງປະເສີດ ແກ້ວສຸວັນ	ຮອງຫົວໜ້າອົງການເຂົ້າຮ່ວມ	ອົງການດັດສົມໂທລະຄົມ
39	ທ່ານ ພົມມະທັດ ພູມະນີວົງ	ຫົວໜ້າພະແນກ ສູນຂໍ້ມູນແຫ່ງຊາດ	ສູນອິນເຕີເນັດ ແຫ່ງຊາດ
40	ທ່ານ ອາເລັກໄຊ ສີພອນ	ຮອງຫົວໜ້າພະແນກ	ສູນສະກັດກັ້ນ ແລະ ແກ້ໄຂເຫດທາງຄອມພິວເຕີ
41	ທ່ານ ນ. ວັນນະພາ ພົມມະທັນ ສີ	ຫົວໜ້າພະແນກອາຊຽນ	ກົມແຜນການ ແລະ ການຮ່ວມມື
42	ທ່ານ ທະວີສັກ ສີຫາລາດ	ວິຊາການ	ກົມເຕັກໂນໂລຊີສື່ສານຂໍ້ມູນຂ່າວສານ
43	ທ່ານ ປອ. ທະວີສັກ ມະໂນທັມ	ຫົວໜ້າສູນ	ສູນບໍລິຫານລັດດ້ວຍເອເລັກໂຕຣນິກ
44	ທ່ານ ປອ. ສົມໄພວັນ ແສງສຸຣິຍະ	ຮອງຫົວໜ້າສູນ	
45	ທ່ານ ນ. ຈິດຕະພອນ ຈັນສີລິລາດ	ຮອງຫົວໜ້າສູນ	
46	ທ່ານ ຄຳຜາຍ ອິນທະຣາ	ຫົວໜ້າພະແນກ	
47	ທ່ານ ນ. ຈາຣຸດາ ຫຼວງລາດ	ຫົວໜ້າພະແນກ	
48	ທ່ານ ວະຊິລະ ມີສະຫວັດ	ຫົວໜ້າພະແນກ	
49	ທ່ານ ນ. ພາວັນ ຫຼວງເສນາ	ຮອງຫົວໜ້າພະແນກ	
50	ທ່ານ ນ. ກິດຕິສັກ ປະສົມສຸກ	ຮອງຫົວໜ້າພະແນກ	
51	ທ່ານ ພູຊະນະ ສີລິວົງ	ຮອງຫົວໜ້າພະແນກ	
52	ທ່ານ ບຸນມີ ທອງປະເສີດ	ວິຊາການ	
53	ທ່ານ ນ. ວຽງຄຳ ເພັດສີຄາມ	ວິຊາການ	
54	ທ່ານ ເຊີດຊູ ວົງພະຈັນ	ວິຊາການ	
55	ທ່ານ ປອ. ສີລິວັນໄຊ ເພັດສຸວັນ	ວິຊາການ	
56	ທ່ານ ນ. ລັດຕະນາ ພິດທະຍາພອນ	ວິຊາການ	
57	Mr. MyoMyint Htike	Assistant Director	National Cyber Security Center
58	Mrs. Hninn Zin Lei	Executive Engineer	Satellite Communications Department, Information Technology and Cyber Security Division, Ministry of Transports and Communications
59	Ms. Yu Yu Han	Junior Engineer	Ministry of Transports and Communications

60	Ms. AYE MYAT THANDA	Staff Officer	National Cyber Security Center
61	Mr. Piya Yuenyongsuwan	Senior Regional Sales Manager	Finema Co.,Ltd.
62	Mr. Pakorn Leesakul	CEO	Finema Co.,Ltd.
63	Ms. Rinsita Siripanyawiphat	Senior Officer	Electronic Transactions Development Agency
64	Miss. Khanit Phatong	Chief Information Officer	Electronic Transactions Development Agency
65	Mr. Maykin Warasart	Sr. Digital Technologist	Digital Government Development Agency (Public Organization) (DGA)
66	Mr. Mazlan Zulkifli	Senior Principal Assistant Secretary	Ministry of Communications and Multimedia Malaysia
67	Mr. Tirta Dhany	Cooperation Analyst	Ministry of Communications and Informatics
68	Ms. Dian Wulandari	Sub-coordinator of portal, IT and Public Info-comms for Regional Affairs	Ministry of Communications and Informatics
69	Mrs. Ardiani Putri	Regional Affairs Officer	Ministry of Communications and Informatics
70	Mrs. Sofi Soeria Atmadja	Coordinator for Regional Affairs	Centre of International Affairs , Ministry of Communication and Informatics
71	Mrs. Sarah Agustianti	Operations Executive	Asosiasi Blockchain Indonesia
72	Mr. Anoloth Phanvongsa	Consultant	SB LAB 856 Co., Ltd
73	Mr. Piya Wongpit	Consultant	National University of Laos
74	Mrs. Asih Karnengsih	Chairwoman	Asosiasi Blockchain Indonesia
75	Ms. Anh Phung	Head of Division	National Electronic Authentication Centre - MIC VietNam
76	Mr. Anh Tuan Nguyen	Officer	Department of Science and Technology - Ministry of Information and Communications
77	Mr. Budi Yuwono	ICT and Tourism Division	ASEAN Secretariat
78	Mr. Mohamad Soleh Irawan		ASEAN Secretariat

Figure 8: List of workshop participant

References:

Press Release, Autoriti Monetari Brunei Darussalam, Public to Exercise High Caution with Cryptocurrencies (Dec. 22,2017), http://www.ambd.gov.bn/SiteAssets/Lists/News/News/AMBD Press Release – Crypto currencies.pdf, archived at https://perma.cc/4N9M-AL26

Digital Government Development Agency. (2019). Blockchain for Government Services, retrieved from https://www.dga.or.th/document-sharing/dga-e-book/annual-blockchain/47115/

PWC, https://www.pwc.com/gx/en/services/legal/tech/assets/estonia-the-digital-republic-secured-by-blockchain.pdf

https://medrec.media.mit.edu/

Phopatchai, N. (2018, July 25). Blockchain for Government driven. *Pachachat: Thailand.* https://www.prachachat.net/columns/news-164619

Shu, C. (2020, December 7). Singapore's government launches blockchain innovation program with $8.9 million in funding. https://techcrunch.com/2020/12/06/singapores-government-launches-blockchain-innovation-program-with-8-9-million-in-funding/

Nagumo, J. (2021, August 4). Cambodia aims to wean off US dollar dependence with digital currency. *NIKKEI: ASIA.* https://asia.nikkei.com/Business/Markets/Currencies/Cambodia-aims-to-wean-off-US-dollar-dependence-with-digital-currency

Thanabouasy, P. (2021, November 15). Government Issues Regulations for Cryptocurrency Miners and Platforms in Laos. The Laotian Times: Lao PDR https://laotiantimes.com/2021/11/15/government-issues-regulations-for-cryptocurrency-miners-and-platforms-in-laos/

Monetary Authority of Singapore. (2021). Foundational Digital Infrastructure for Inclusive Digital Economies. https://www.mas.gov.sg/-/media/MAS/Fintech/FDI/Foundational%20Digital%20Infrastructures%20for%20Inclusive%20Digital%20Economies.pdf

Z.Chen. (2021). *The Fortune*. Retrieved from https://fortune.com/2018/06/25/blockchain-cryptocurrency-technology-regulation-bitcoin-ethereum/

Finextra. (2021, May 31). Retrieved from https://www.finextra.com/blogposting/20394/crypto-regulation--whether-you-fear-it-or-embrace-it-crypto-is-bound-to-stay

TTP Technology. (2021). Retrieved from https://www.tpptechnology.com/blog/how-the-blockchain-technology-landscape-will-change-in-2021/

CNBC. (2021). Retrieved from https://www.cnbc.com/2021/05/24/chinas-latest-move-on-crypto-regulation-nothing-new-says-hsbc-.html

European commision. (2021). Retrieved from https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-blockchain

Annex 1: Questionnaires

Blockchain for Digital Government- the ASEAN way

Questionnaires Survey

The project was adopted in 1st ADGMIN in Jan 2021, which aims to study blockchain technologies for government service's digital transformations to map opportunities, challenges, gaps, and put forward recommendation on how ASEAN states together leverage this upcoming technology to create trusted and transparent digital services. The following information is required in connection with project of the blockchain for digital government- the ASEAN way. The correspond target are the relevant officials in the ASEAN Member States responsible for digital policy maker, regulator, and relevant stakeholder of technology solution provider. Please spare your precious time to give information to the following questions.

Implementing Agency: **E-Government Center,**

Ministry of Technology and Communications, Lao PDR

Responder information:

1. Name:……
2. Position:……
3. Organization:……
4. Country:……
5. Email address:……..

Survey collector information:

Project Implementation Agency contact point: **E-Government Center,**

Ministry of Technology and Communications

E-mail: kittisack@mpt.gov.la, vannapha@mpt.gov.la

Tel/WA: +856 21 316600, +856 20 55564614

It would be greatly appreciated the completed questionnaire could be return to the above motioned e-mails **before 29 June 2021**. Thank you for your kind attention.

Section 1: This section, we would like to explore and examine current status of how each government see blockchain in your national ICT vision

1. Which of the following describe how your country view the importance of blockchain technology has shifted between each period in the national ICT/ digital master plan? (Please √ in the box below one for each statement)

Relevancy	***Previous*** ICT Master plan 2015-2020	***Current*** ICT Master plan 2020-2025	***Future*** ICT Master Plan 2025-2030 (Vision)
Critical and in our top-five strategic priorities			
Important but not in our top-five strategic priority			
Relevant, but not a strategic priority			
Haven't reached a conclusion			
Not be relevant			

1.2 Main reason for adopting blockchain within ICT/digital master plan?

……

……

……

……

……

……

1.3 Does private sector involve in the process of develop of ICT/digital master plan?

☐ No ☐ Yes, please identify……

…

……

……

……

……

1.4 Could you provide details of the laws, acts, decision and regulations which relate to blockchain technology?

Legislation	**Details (Name, number, date, and link (if applicable)**	**URL to download**
Law/Acts		
Decree		
Decision		
Notice		
Others		

2. Attitudes toward blockchain and its adoption

2.1 What is your level of agreement or disagreement with each of the following statement regarding blockchain technology? (Please √ in the box below one for each statement)

Statement	Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree	Not applicable
Blockchain technology is broadly scalable and will eventually achieve mainstream adoption						
Our ministry leaders believe there is a compelling business case for the use of blockchain technology for government e-services or projects						
Our private sector, citizens, or NGO are considering or working on blockchain solutions to enhance e-services value chain for government services						
My organization or e-services provided to citizens will lose its competitive advantages if we don't adopt						

blockchain technology						
Blockchain is overhyped, it will not impact how our citizens decision to use government e-services						

2.2 In adopting new technology, there's sure a lot of roadblock, we would like to understand from e-Services point of view that you are providing to your citizen either by government or private sector. What are the roadblocks for blockchain adoption in government e-services?

Statement	**Strongly Disagree**	**Disagree**	**Neither disagree nor agree**	**Agree**	**Strongly Agree**	**Not applicable**
Regulatory uncertainty	☐	☐	☐	☐	☐	☐
Lack of trust among users	☐	☐	☐	☐	☐	☐
Ability to bring network together	☐	☐	☐	☐	☐	☐
Silo development of blockchain network across ministries	☐	☐	☐	☐	☐	☐
Inability to scale	☐	☐	☐	☐	☐	☐
Intellectual property concerns	☐	☐	☐	☐	☐	☐
Audit / Compliance concerns	☐	☐	☐	☐	☐	☐

Section 2: We would like to understand your view on the blockchain technology trends, the tools being deployed, standards that your country adopt or plan to adopt, or communities that are likely to be suitable for digital government transformation

3. **Please tell us how Blockchain technology being used/adopted for e-Service in your country**

e-Services with Blockchain technology	None	Research	Development	Pilot	Live	On-hold
Registration						
Public Identification Document / Profile Record						
Birth / Marriage / Death Certification						
Registration of new business						
Vehicle Registration						
Property titles						
Permits and License						
Passport / Travel Document / VISA						
Work Permit						
Announce of Movement / Migration / Immigration						
Medical Certificate and Medical Records						
Driver License						
Enrolment of Education and Education Certified						
Professional Certification						
Customs Declaration of Goods, Logistic Facilitation and Quarantines						
Revenue Generating						
Online Import / Export Payment and Taxation						
Government contracts and tenders						
Social Returns						
Education Grants						
Open Public Data						
Benefits and Payments						
Migrants, refugees and visitors						
People with disability						
Veterans						
Social Security						
Public Safety and Law						
Complaints						
Consumer protection						
Financial						
Digital currency						
Private shares						
Insurance						
Remittance						

3.1 Looking from regulator point of view, how do you as regulator planning to regulate blockchain used?

Statement	Select all that applied
We have dedicate team/department taking care of drafting blockchain standards	☐
The committee drafting standard comes from public and private sector	☐
We follow IEEE standard as guideline	☐
We follow W3C standard as guideline	☐
We follow other standards _____ as well as making our own	☐
No, we still do not know where to start	☐

3.2 Looking from the policy maker point of view, please tell us How do you agree or disagree with the following blockchian application or suitability for E-Government services

Statement	Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree	Not applicable
Legal Enforcements (Public Safety and Law): Government scan use Public Blockchain data to monitor transaction to facilitate legal transaction and stop money laundering	☐	☐	☐	☐	☐	☐
Legislation Records (Registration): With decentralized ledger, Governments can keep a record of all the legistration reports in a better way	☐	☐	☐	☐	☐	☐
Bills and Payments (Revenue Generating):	☐	☐	☐	☐	☐	☐

Governments can impose blockchain technology to improve the traditional billing and payment system						
Welfare Distribution (Benefits and Payments): Blockchain technology can be a great way to cut off system losses which will pay the way for better welfare distribution	☐	☐	☐	☐	☐	☐
Digitized IDs (Permits and License): with decentralized ledger, Government can implement digital IDs for the citizens	☐	☐	☐	☐	☐	☐
Healthcare : Government can improve healthcare services by utilizing distributed legers	☐	☐	☐	☐	☐	☐
Cyber Protection: Government can use blockchain technology to protection vital Government infrastructure against cyber attacks and hacks	☐	☐	☐	☐	☐	☐
Security & Safety with blockchain technology Government can provide better social security against online frauds	☐	☐	☐	☐	☐	☐
Taxation: with decentralized ledger, Government can foster better transparency solving tax issue	☐	☐	☐	☐	☐	☐

Section 3: We would like to hear your open opinion on challenges and opportunities in leveraging blockchain technology in government e-services.

1. **If your country have already implemented blockchain in one of e-Services, How do you see changes impact user trust on the e-services between old vs. blockchain based e-service?**

   ……
   ……..
   ……
   ……..
   ……
   ……..
   ……
   ……..
   ……
   ……..

2. **How far can blockchain technology will be integrated into e-services?**

   ……
   ……..
   ……
   ……..
   ……
   ……..
   ……
   ……..
   ……
   ……..

3. **How do you get resource to invest in blockchain technology?**

   ……
   ……..

……

……..

……

……..

……

……..

4. **Do you have sufficient resources (personal and budget) to develop blockchain technology?**

……

……..

……

……..

……

……..

……

……..

Thank you for your input and cooperation!

Annex 2: Workshop Materials

Opening Session

Welcome Remarks and Project Overview

BLOCKCHAIN FOR DIGITAL GOVERNMENT – THE ASEAN WAY

By:

e-Government Center
Ministry of Technology and Communications
Lao P.D.R.

About Project

Blockchain for Digital Government – the ASEAN way

Project:

endorsed at the 1st ADGMIN in January 2021 and supported by ASEAN ICT Fund (AJICTF), where Lao PDR, E-Government Center is leading agency to implement this activities

Reference

- AIM 2020 (AIM2020 Publication Final)

  Thrust 2: Digital Transformation Initiative - Emerging technologies (e.g.: AI, IoT, 5G, big data, etc.)
  Thrust 3: Resilience, Trust and Security - Addressing risks and threats of emerging technologies

- MPAC 2025 strategic objectives:

  Sustainable infrastructure: increase public and private infrastructure investment in each ASEAN member states, as needed

Objectives

The project aims to compare blockchain technologies for government service's digital transformations in order to map opportunities, challenges, gaps, and put forward recommendation on how ASEAN states together leverage this upcoming technology to create trusted and transparent digital services. The study shall

(1) examine current status of how each government see blockchain in their national ICT vision;

(2) evaluate blockchain technology trends of tools, standards, or communities that are likely to be suitable for digital government transformation especially those which are being considered in successful cases

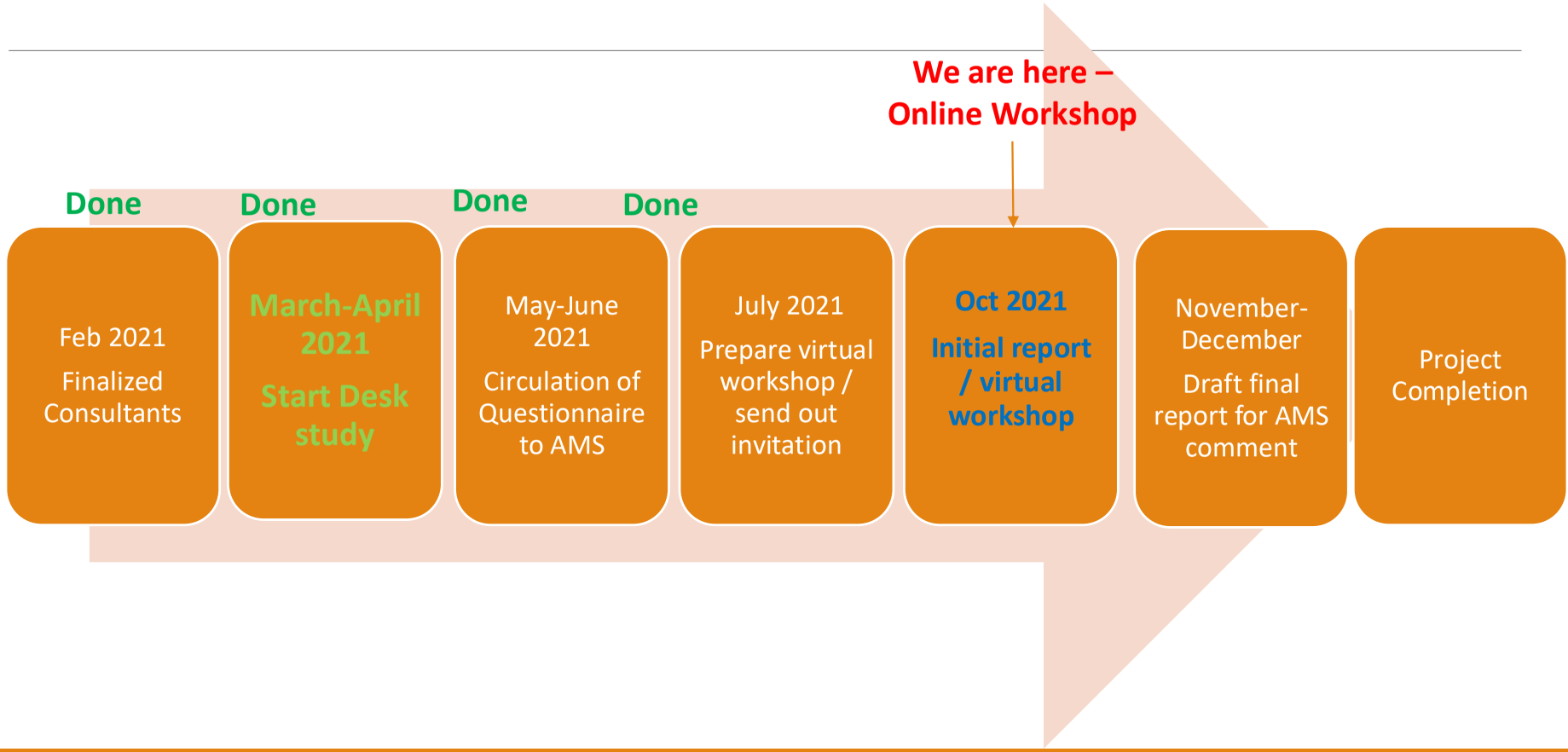
(3) compare blockchain adoption case studies in order to recommend different route that ASEAN policy makers can consider in leveraging the technology.

Expected Output

Final Report :

- The literature review of blockchain technologies being adopt , and some available ASEAN nations.
- The survey data analysis of blockchain technologies being adopted for digital government in AMS.
- Recommendation on possible Roadmap and ASEAN blockchain action plan.

Project Activities – What we done and next step



Workshop Output

- Update desk study.
- Initial findings of Survey
- Sharing information, Discussion and Recommendations

Thank you!

Blockchain for digital government - the ASEAN way Online Workshop

Indonesia's Regulatory and Implementation Update

ASOSIASI BLOCKCHAIN INDONESIA

Ministry of Communications and Informatics

ASOSIASI BLOCKCHAIN INDONESIA

Crypto Asset Trend in Indonesia

Daily Transaction Value
reached **2.3 T**, an increase of
1.178% from 2020 of 180 B.

Total Transaction Value
reached **478.5 T**, an increase of
636% from 2020 of 65 T.

Total **Crypto Asset Investors**
reached **7.4 million**, an **85%**
increase from 2020 of 4 million people.

Ministry of Communications and Informatics

ASOSIASI BLOCKCHAIN INDONESIA

VISION

Asosiasi Blockchain Indonesia (A-B-I) aims to mobilize and organize Blockchain technology actors in creating a quality business environment that spurs the understanding, utilization, progress and competitiveness of Blockchain technology, in conjunction with the 4.0 industry revolution, both at the national and international levels

MISSION

Socialization to the community and business actors related to Blockchain technology and 4.0 industry revolution, so as to gain an optimal understanding and utilization.
Assessment, formulation and policy advocacy to government and non-government institutions for the creation of regulatory systems that support the growth and development of the highly competitive Blockchain Indonesia technology.

Ministry of Communications and Informatics

ASOSIASI BLOCKCHAIN INDONESIA

The Journey

2017

Indonesian Blockchain Association (A-B-I) **Inauguration** by the Chairman of KADIN

2018

Minister of Trade Regulation Number 99 of 2018 - **Crypto as a Commodity**

2019

1. CoFTRA Regulation no 5, no 9 of 2019, no 2, no 3, & no 7 of 2020 - **Crypto Asset Trading Technical Procedure in Indonesia**
2. Finhacks #Blcockhainnovation - **The biggest hackathon in Southeast Asia by BCA and A-B-I**

2020

1. **KBLI for Blockchain Companies** by the Ministry of Communication and Information
2. National Blockchain education event - **Indonesian Blockchain Conference by A-B-I**

2021
Blockchain Council

An institution that observe & supervise the blockchain industry in Indonesia.

Ministry of Communications and Informatics

ASOSIASI BLOCKCHAIN INDONESIA

Ministry of Communications and Informatics

ASOSIASI BLOCKCHAIN INDONESIA

Terima Kasih

Let's connect:

@asihkarsh

+62 822 9722 4492

asih@asosiasiblockchain.co.id

Blockchain for Digital Government ASEAN way - Laos

13 Oct 2021

ກະຊວງ ເຕັກໂນໂລຊີ ແລະ ການສື່ສານ
Ministry of Technology and Communication

ສູນບໍລິຫານລັດດ້ວຍເອເລັກໂຕຣນິກ
E-Government Center, Laos

Bitcoin or Blockchain

Blockchain vs Bitcoin using LAK analogy

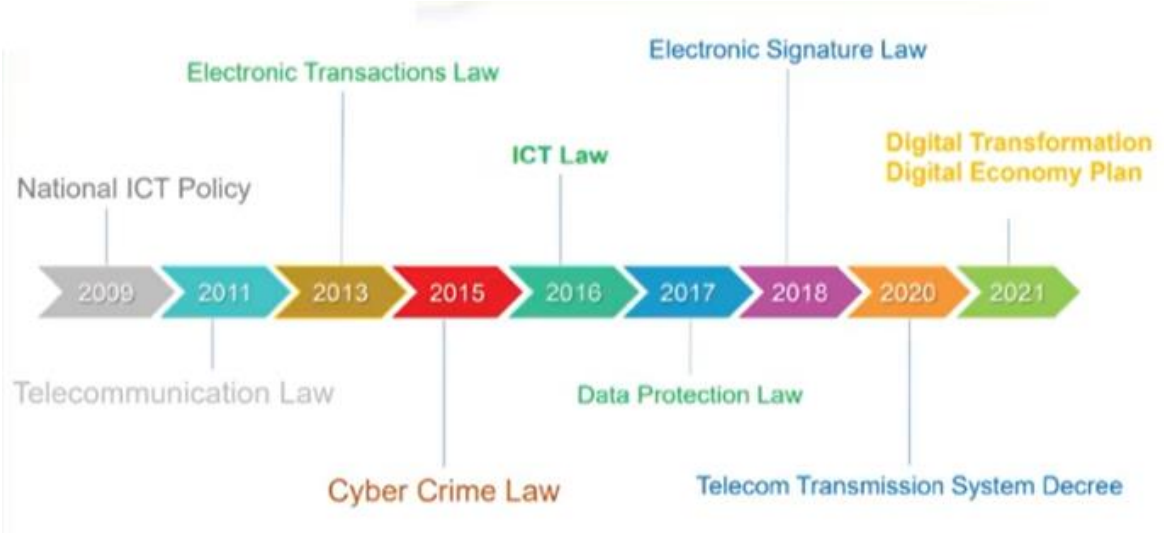
Blockchain is parallel to the paper technology behind LAK bill

LAK Denomination is parallel to Bitcoin, Ethereum

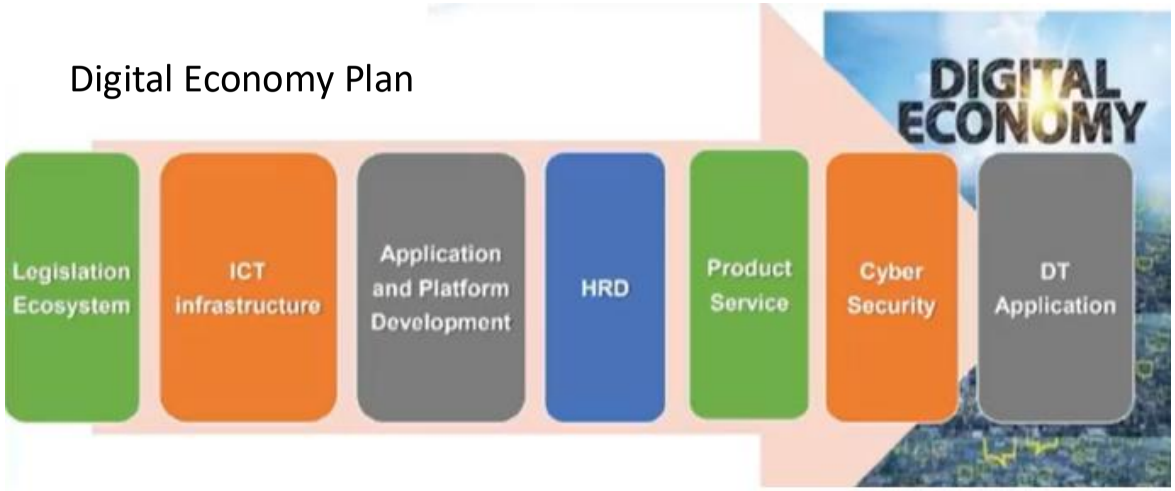
Source : MIGHT

Need Act/Law to support

- Need UNCITRAL Model Law on Electronic Transferable Records (MLETR) into domestic legislation.



Digital Economy Plan



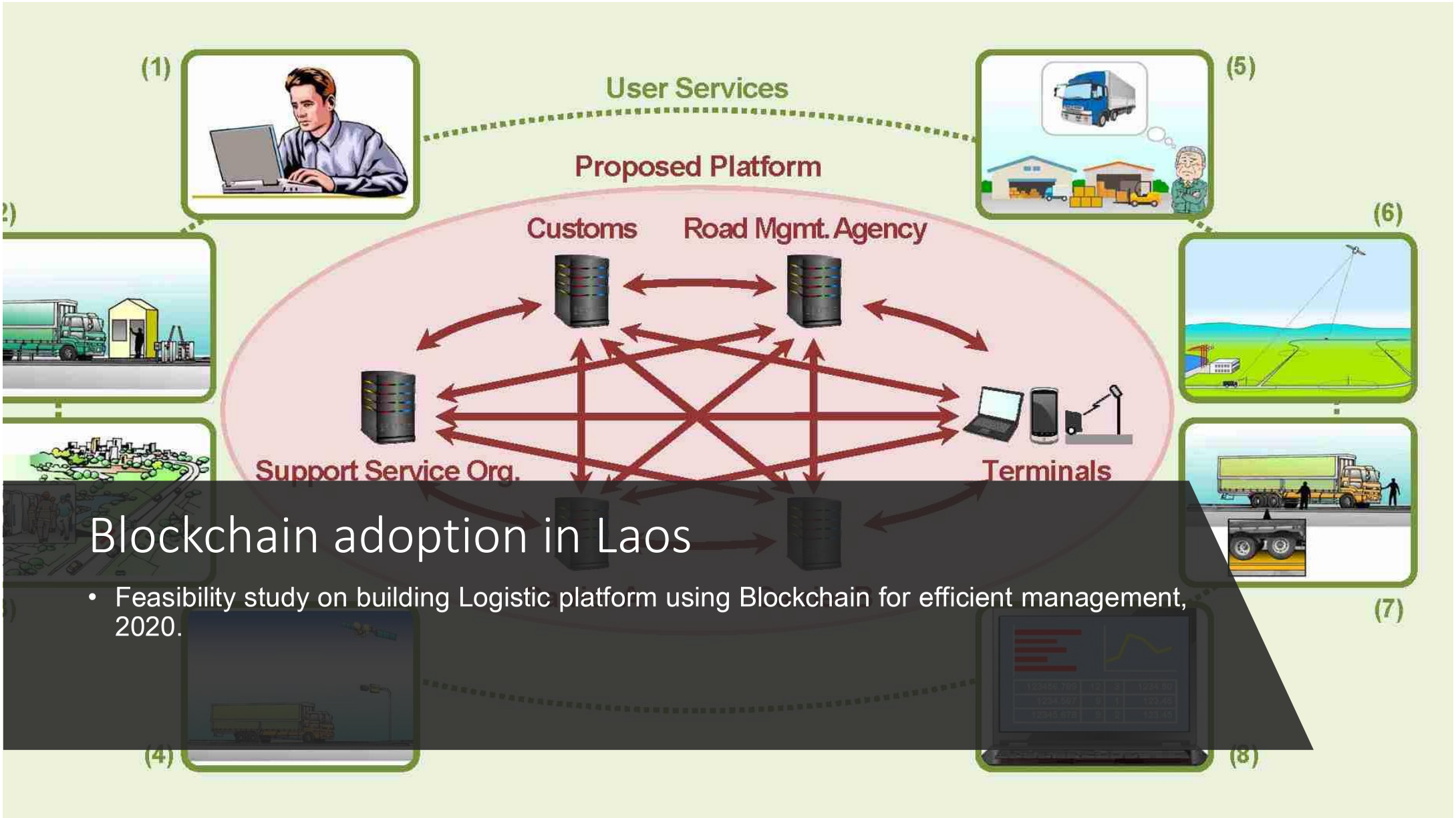
Use case

Cryptocurrency Trial Program in Laos

- Sep 2021, The government of Laos has authorized six companies to trade and mine cryptocurrencies while relevant ministries are to draft regulations governing their use.

Digital Currency in Laos

- The Bank of the Lao People's Democratic Republic recently signed a memorandum of understanding with the Japan International Cooperation Agency on studying the development of a central bank digital currency, 2021.



Blockchain adoption in Laos

- Feasibility study on building Logistic platform using Blockchain for efficient management, 2020.

Thank you

Q & A Session !

MINISTRY OF COMMUNICATIONS
AND MULTIMEDIA MALAYSIA

WORKSHOP ON BLOCKCHAIN FOR DIGITAL GOVERNMENT

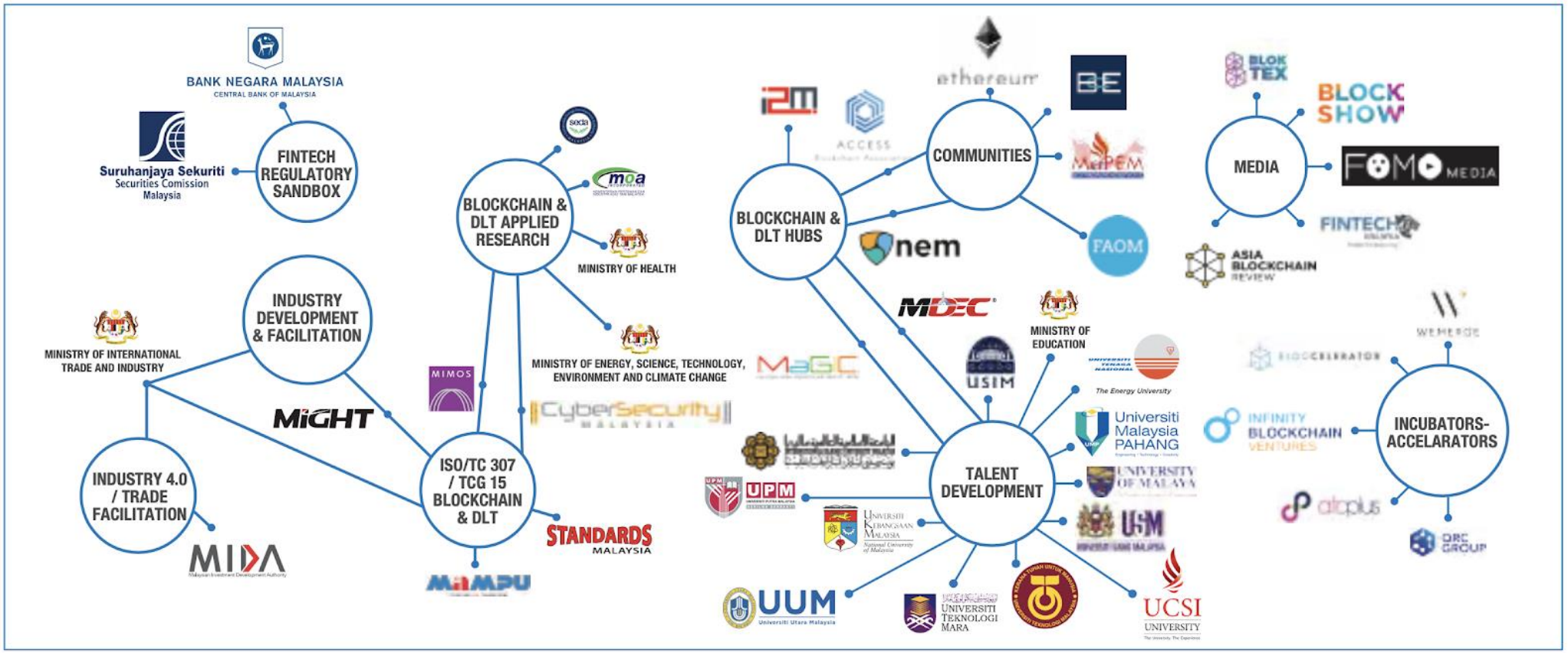
13 October 2021 (Wednesday)
Virtual Conference

MINISTRY OF COMMUNICATIONS
AND MULTIMEDIA MALAYSIA

Malaysia is looking at “blockchain” technology that include both blockchain and DLT as one, in tandem with the initiative being pursued at ISO level, such as TC 307 (Committee for Blockchain and Distributed Ledger Technology), where Malaysia is one of the founding members.

MINISTRY OF COMMUNICATIONS AND MULTIMEDIA MALAYSIA

EARLY BLOCKCHAIN PLAYERS IN MALAYSIA



MINISTRY OF COMMUNICATIONS
AND MULTIMEDIA MALAYSIA

Brief History :

2015 - started with the Securities Commision (SC) and Bank Negara Malaysia (BNM), primarily directed to the financial system via fintech development.

2016 - Malaysia set up the National Mirror Committee on Blockchain and DLT

MINISTRY OF COMMUNICATIONS AND MULTIMEDIA MALAYSIA

Snapshot of Key Milestones / Pilot Projects in Malaysia

Standards Malaysia	Creation of TC/G/15 National Mirror Committee on Blockchain and DLT One of Founding members for the global ISO committee for Blockchain and DLT TC307 Blockchain & DLT	2016
Bank Negara Malaysia (BNM)	Bank Negara Malaysia will be running a proof-of-concept (PoC) project to gauge the merits of central bank digital currency (CBDC) with an initial focus on wholesale CBDCs.	23 June 2021

MINISTRY OF COMMUNICATIONS AND MULTIMEDIA MALAYSIA

Snapshot of Key Milestones / Pilot Projects in Malaysia

Securities Commission (SC)	Project Castor, the pilot simulated the Equity Crowdfunding environment. Led by Securities Commission Malaysia with Neuroware, a home grown blockchain company.	28 Nov 2018
	As of August 2021, SC has registered 4 Recognized Market Operators (RMOs) to establish and operate digital asset exchanges (DAX) in Malaysia. [3] - Luno Malaysia Sdn Bhd - SINEGY Technologies (M) Sdn Bhd - Tokenize Technology (M) Sdn Bhd - MX Exchange Sdn Bhd	29 July 2021

MINISTRY OF COMMUNICATIONS AND MULTIMEDIA MALAYSIA

Snapshot of Key Milestones / Pilot Projects in Malaysia

Bursa Malaysia	Bursa Malaysia is utilising blockchain in a proof-of-concept (PoC) geared towards greater transparency and smoother operations in the securities borrowing and lending (SBL) market.	7 May 2019
Malaysia Automotive Institute (MAI)	Malaysia Automotive Institute (MAI) invests RM2m in blockchain tech.	28 Nov 2018
MIGHT	Malaysia to use Blockchain for bettering Islamic finance, renewable energy and palm oil sectors.	17 Sep 2018

MINISTRY OF COMMUNICATIONS
AND MULTIMEDIA MALAYSIA

Thank you

Current Status of Blockchain Technology in Myanmar

Information Technology and Cyber Security Department, Myanmar

Content

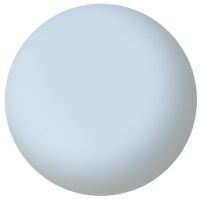
- Internet Usage in Myanmar
- Blockchain in Usage
  - Capital Market
  - Migrant Workers
  - Local SME : Microfinance
- Smart City Project
- Policy and Legal Measure
- Emerging Crypto currencies
- Challenge

Internet usage in Myanmar

- There were 23.65 million internet users in Myanmar in January 2021.
- Internet penetration in Myanmar stood at 43.3% in January 2021.

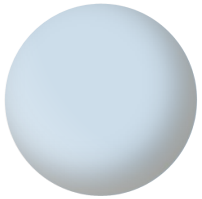
Social media statistics for Myanmar

- There were 29.00 million social media users in Myanmar in January 2021.
- The number of social media users in Myanmar was equivalent to 53.1% of the total population in January 2021.



Blockchain for capital markets system

- In 2016, YSX established cooperation with Tokyo-based Daiwa Securities Group to explore the use of blockchain to support the exchange's operations.
- Under the cooperation framework, Daiwa's blockchain-based equity trading platform will be integrated with the YSX's exchange platform to facilitate the development of a more efficient bookkeeping system.
- During the pilot phase of the project, blockchain, which dispenses with the need for a centralized server, enabled the stock exchange to maintain its operations despite the country's frequent power outages.



Blockchain Support for Myanmar's Migrant Workers

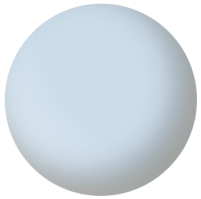
- The Central Bank of Myanmar had in April, 2019 officially endorsed the use of blockchain for the national payment system, approving collaboration between Shwe Bank of Myanmar and Krungthai Bank of Thailand to develop a blockchain-based cross-border remittance system between the neighboring countries.

- Shwe Bank and Krungthai Bank are exploring the use of Bangkok-based Everex's blockchain platform to develop an Ethereum (ETH)-based cross-border remittance system to provide a secure channel through which the 3 million Myanmar migrant workers in Thailand can wire money to their families back home.

Blockchain for Local SMEs : Microfinance Sector

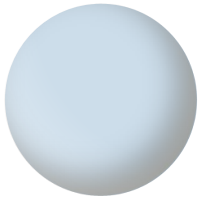
- In 2016, Myanmar became the first country in the world to use blockchain for microfinancing, following a pilot project by Japanese software development firm Infoteria testing the decentralized technology on the computer system of Yangon-based microfinance institution BC Finance.

- However, major obstacles remain. Infoteria highlighted the problem of blackouts and the "low quality of local circuits," damaging the reliability of the country's internet infrastructure and, therefore, inhibiting further adoption and development of blockchain in the nation.



Smart City

- Given the country's past explorations of the technology, Myanmar appears to be a believer in blockchain and its potential. Nonetheless, it continues to struggle with energy insecurity due to the instability of its power grid. The World Bank recommends that Myanmar double investment in its power sector to US$2 billion from 2020 onwards.
- The country's upcoming smart city, Yatai, presents an ideal opportunity to develop a more stable power grid, paving the way to unlocking blockchain's potential and sustain Myanmar's economic growth.



Policy and Legal Measure

- In 2019, the Central Bank of Myanmar issued two warning statements against the use of cryptocurrency.
- In the first warning statement issued on May 3, 2019, the types of cryptocurrency that was banned from being traded was not disclosed, but it has been issued as a warning.
- On May 15, 2020, it issued a statement restricting cryptocurrency transactions and prosecuting violators, but did not specify the exact type of penalties.

Emerging Myanmar Crypto Currency

Due to political instabilities, reliability of citizens upon banks are declining.

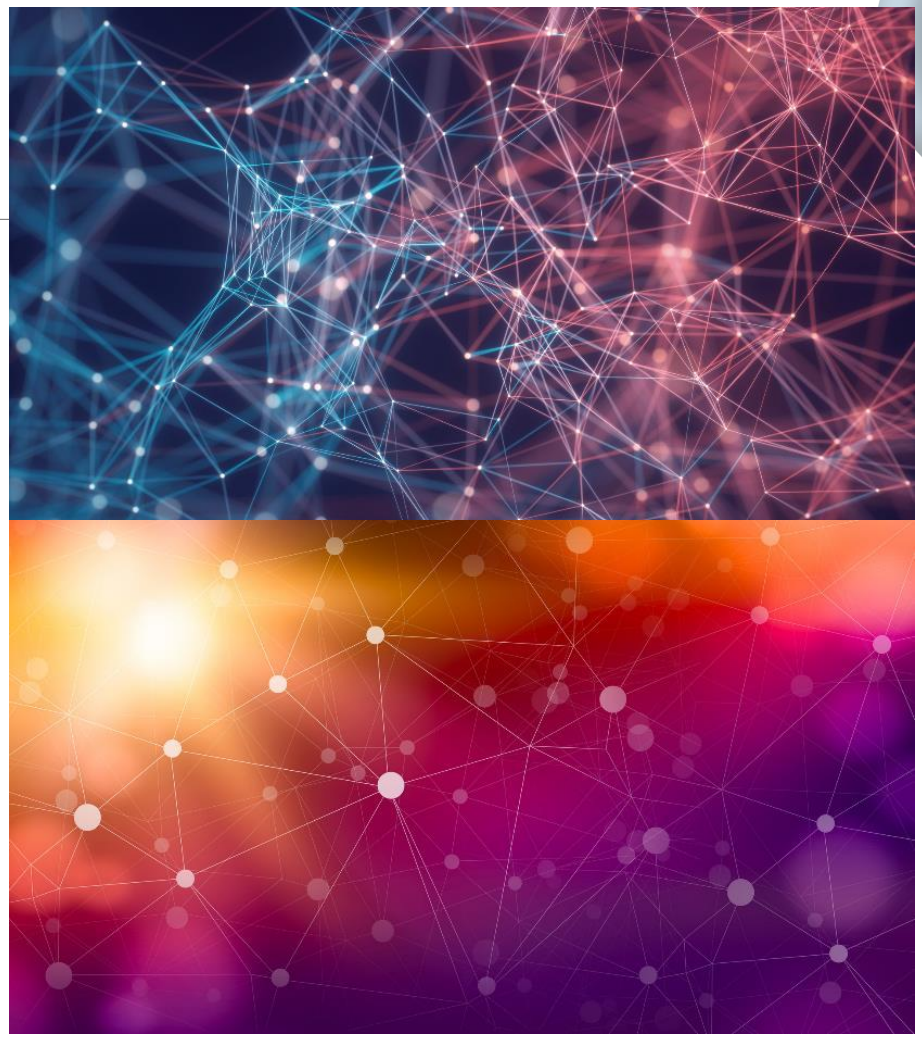
MYD Crypto Currency was emerging in 2021.

Challenges

- Insufficient in National Infrastructure such as electricity and technology
- Policy Constraints
- Poor Digital Literacy for financial sector

Thank You

Ms. Aye Myat Thanda
Staff Officer
National Cyber Security Center,
Myanmar.



Blockchain for Digital Government

ASEAN way -Thailand

Electronic Transactions Development Agency

13 Oct 2021

What Have Been Initiated!

Regulatory

- **Digital Asset Act** 2018 by Securities and Exchanges Commission (SEC)
- Draft of Electronic Transaction Act amendment by Electronic Transactions Development Agency (ETDA) to incorporate Electronic Transferable Record (ETR) based on **UNCITRAL Model Law on Electronic Transferable Records (MLETR)**

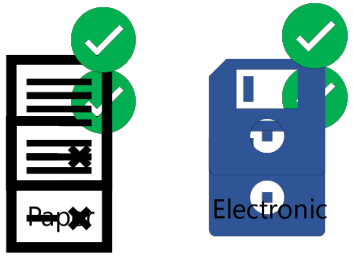
Promotion

- Technical standard for **Verifiable Credentials (VC)** and **Verifiable Presentations (VP)** in accordance with W3C
- Technical guideline for **Decentralized Key** Management System (DKMS)
- Innovation **Testbed** by ETDA focusing on Self Sovereign Identity (SSI) model –new approach that individuals can control their Digital IDs
- Innovation **Sandbox** focusing on new technologies that support Digital IDs and e-Document use-cases by several regulators such as ETDA, Bank of Thailand, Revenue department
- **Blockchain Professional Certification** program by Thailand Professional Qualification Institute

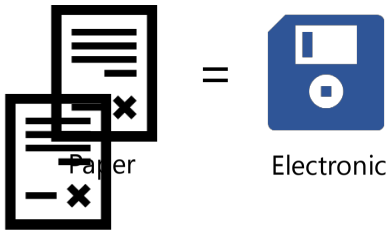
Why we need MLETR !!

Key principles

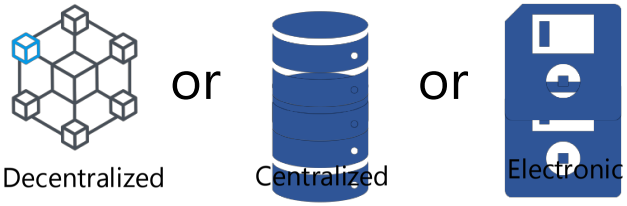
Non-discrimination against the use of electronic means



Functional equivalence



Technological neutrality



Why we need MLETR !! (Cont.)

Key principles

Singularity

- Prevent the multiple claims to perform the same obligation
- Prevent unauthorized replication of ETR by the system
- Require reliable identification of ETR

Control

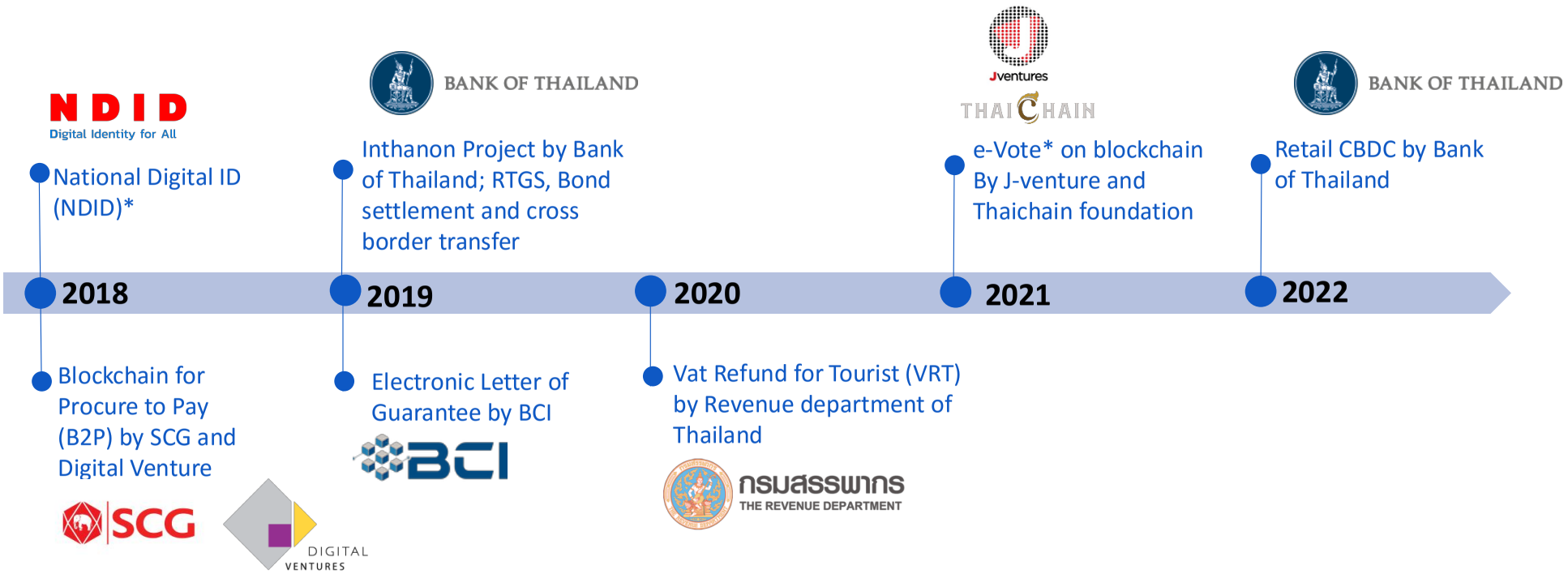
- Control over the electronic transferable record in a manner equivalent to physical possession
- Use of a reliable method to identify the person in control of ETR

Integrity

- Information remains complete and unaltered from the time of the creation of ETR until it ceases to have any effect or validity

Blockchain Landscape in Thailand

Sample key use-cases in Thailand



Note: * testing in ETDA's Sandbox

THANK YOU

ขอบคุณค ะ

Blockchain development in Vietnam

Ministry of Information and Communications - 2021

Current situation

- Blockchain is hot “key word” of technology in last 5 years in Vietnam
- Many startups develop products/service based on Blockchain technology.
- Many blockchain hackathons were organized in last 5 years.
- Many conferences/workshops/seminars/meetups related to blockchain technology were held

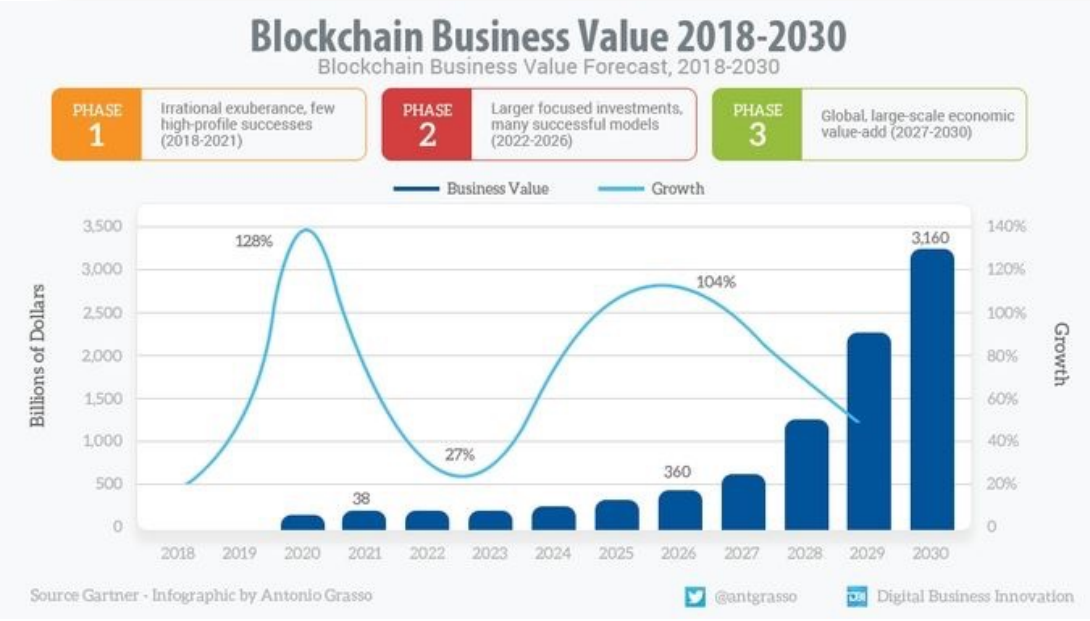
Current situation: directions

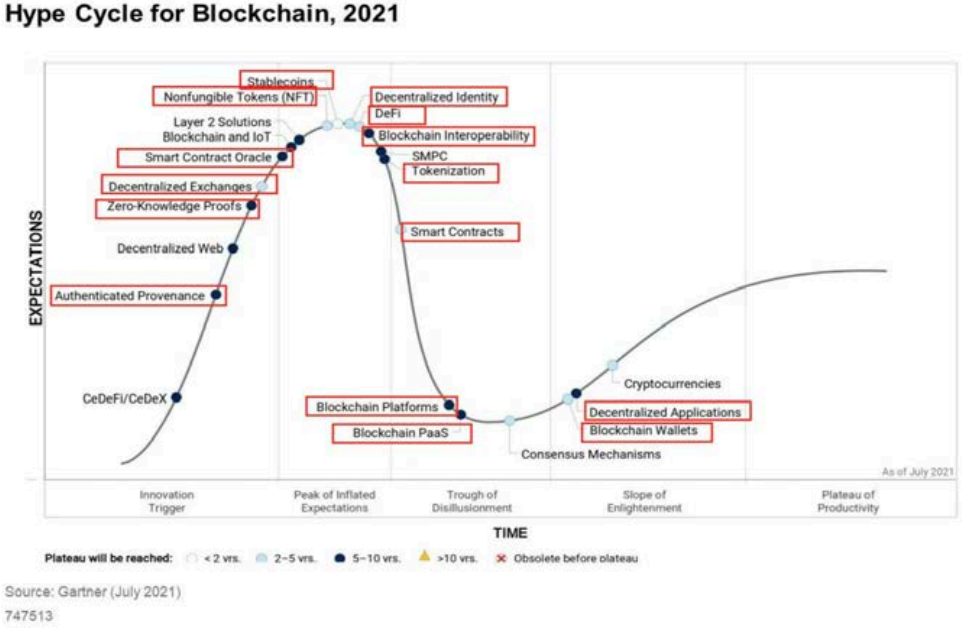
- Resolution 52-NQ/TW dated May 27, 2019 of the Politburo on guidelines and policies to actively participate in the fourth industrial revolution (4IR);
- Decision 749/QD-TTg dated June 30, 2020 of the Prime Minister approving the National Digital Transformation Program to 2025, with a orientation to 2030.
- Decision No. 942/QD-TTg dated June 15, 2020 of the Prime Minister, Approving the Strategy to develop Digital-Government towards digital government in the period of 2021 - 2025, with a vision to 2030

Current situation: products/services

- Areas that blockchain pilot projects has been implemented
  - Agriculture products track and trace.
  - Logistics management;
  - Bank L/C management;
  - eContract/eInvoice management;
  - Identity management; scoring/coupon management;
  - Blockchain-based Games/NFT

Next step: blockchain potential





Next step: Roadmap

- Building a National Blockchain Development Strategy (roadmap)
  - Legal framework for applying blockchain in sectors (gov, finance, fintech…)
  - Policy for blockchain development (blockchain platform, blockchain services…)
  - Policy for blockchain adoption in sectors
  - Human resource development in blockchain and other digital technologies
  - Technical standards of blockchain technology

ASEAN collaborations

- Sharing experience of blockchain development/adoption
- Collaborating in technical standards/interoperability
- Others

Thank you for your attention!

Pham Quoc Hoan – Deputy Director General

National e-Authentication Centre, MIC

Contact: pqhoan@mic.gov.vn / pqhoan@gmail.com

Mobile: +84 91 336 2858

Blockchain for digital government – the ASEAN way.

Inception Report

13-Oct-2021

Contents

- About project
- Objectives
- Methodology and expected output
- Initial findings of Survey
- Discussion points and recommendations

Methodology

Objective

Compare blockchain technologies for government service's digital transformations to create trusted and transparent digital services for our citizens.

Main Area

- Trends
- Standard
- Adoption

Input of activities / Work stream

I.1 Literature review of blockchain technology trends of tools, standards, and communities usage of blockchain to find out the what blockchain really is and how it will likely bring the benefit to digital government

I.2 Carry out survey of status of blockchain use cases being considered in each ASEAN Member States to understand the gaps of policy and technology standards between least developed countries and highly developed countries of blockchain adoption.

I.3 Workshop as a dialog to evaluate use cases by sharing ideas between ASEAN head of ICT policy makers and blockchain use case vendors

Output

O.1 Examine current status of how each government see blockchain in their national ICT vision

O.2 Evaluate blockchain technology trends of tools, standards, or communities that are likely to be suitable for digital government transformation especially those which are being considered in Japan and European Union

O.3 Compare blockchain adoption case studies in order to recommend different route that ASEAN policy makers can consider in leveraging the technology

ASEAN Blockchain Report

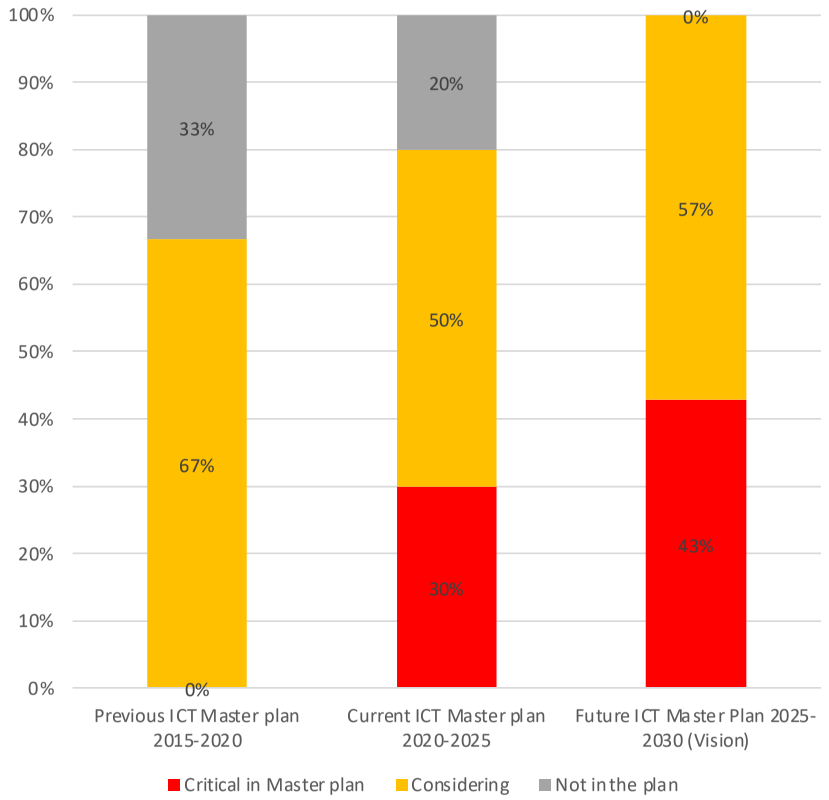
- Country Report
- Status Map
- Recommendation

Survey Result

NO	COUNTRY	NOTE
1	Thailand	Received
2	Malaysia	Received
3	Singapore	Received
4	Vietnam	Received
5	Indonesia	Received
6	Lao	Received
7	Myanmar	Received
8	Philippines	N/A
9	Brunei	N/A
10	Cambodia	Received

Importance of blockchain technology has shifted between each period in the national ICT/ digital master plan

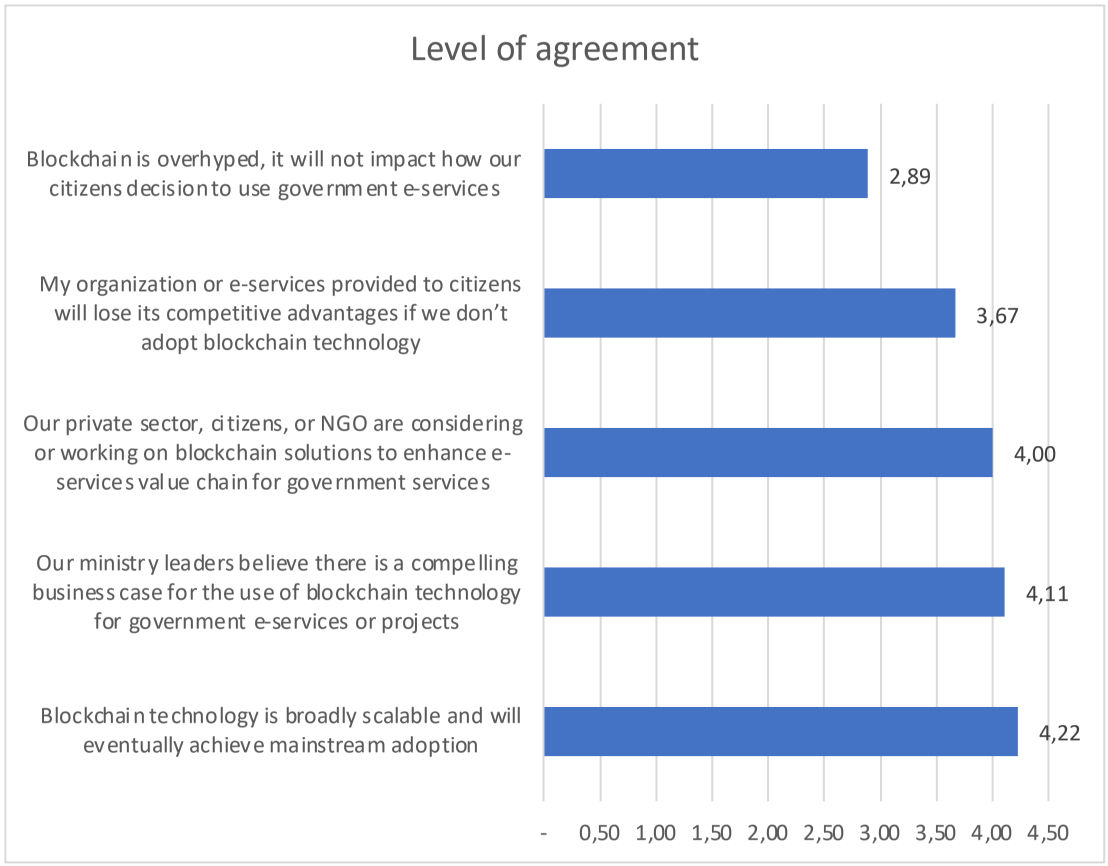
	Previous ICT Master plan 2015-2020	Current ICT Master plan 2020-2025	Future ICT Master Plan 2025-2030 (Vision)
1. Critical and in our top-five strategic priorities	0%	30%	43%
2. Important but not in our top-five strategic priority	67%	50%	57%
3. Relevant, but not a strategic priority	33%	10%	0%
4. Haven't reached a conclusion	0%	10%	0%
5. Not be relevant	0%	0%	0%



Responding Yes/No

F.1 We see a big shift in the important of blockchain in the ICT Master plan since 2015-2020 period where 33% did not consider blockchain in strategy and 67% consider as not top 5 priority. We see the huge shift in 2020-2025 master plan that 30% see as critical to its strategy while 50% start to see the important. Looking further in the vision we see that all country no doubt will consider blockchain into the strategy while 43% take it very critically that it must be in ICT strategy

Attitudes toward blockchain and its adoption



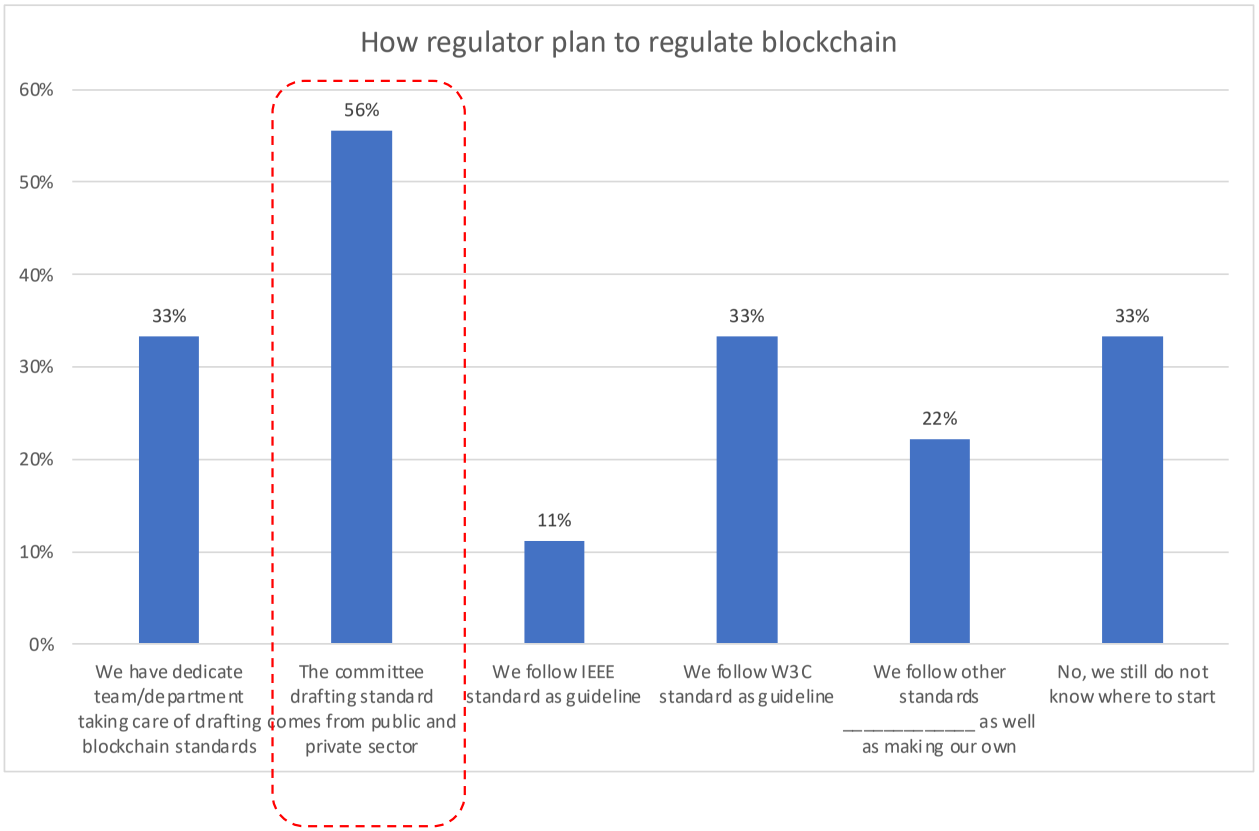
Responding 1 Strongly Disagree – 5 Strongly agree

F.1

The top management in each member state see blockchain as an integral parts of their strategy high confident 4.11 average; while it's backed up by the idea that blockchain will achieve its main stream in the near future 4.22 corresponding to the believe that blockchain is no longer an overhype 2.89

The majority also believe that the private sector and NGO involvement with government twill add more value to the development of blockchain 4.00 where there's a general agreement that organization will lose its competitive advantage if not involve the blockchain.

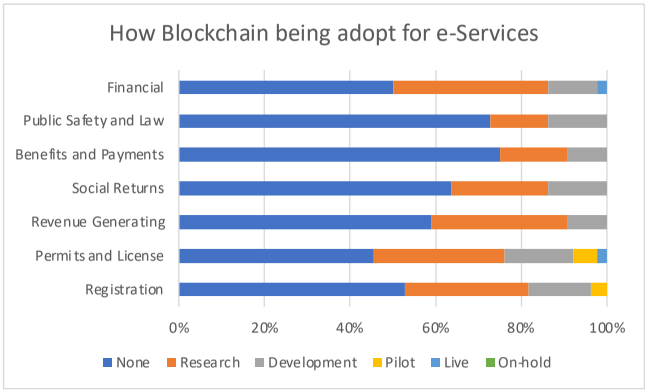
How AMS plan to regulate blockchain



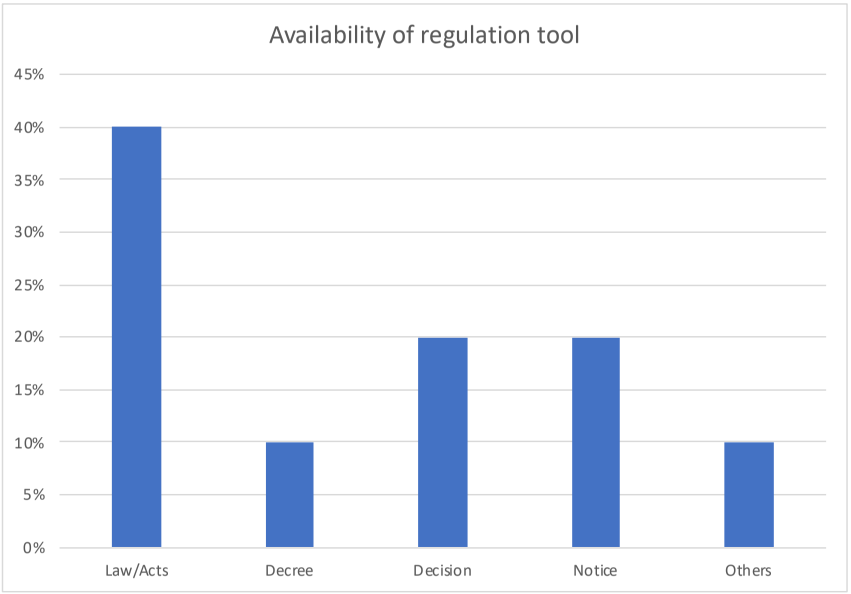
Responding Yes/No

F.1

Given that more than 80% of AMS still in early phase of blockchain adoption; The regulating part is in more progressing stage where 56% claiming to have committee from public and private sector to look into the issue or having dedicate team drafting the blockchain standard. Nonetheless, the already existing standard as such IEEE and W3C standard are not yet while adopted



Available of regulation on blockchain



Responding Yes/No

	Thailand	Malaysia	Singapore	Vietnam	Indonesia	Lao	Mynmar	Philiphines	Brunei	Cambodia
Law/Acts	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
Decree	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
Decision	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗
Notice	✓	✗	✓	✗	✗	✗	✗	✗	✗	✗
Others	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓

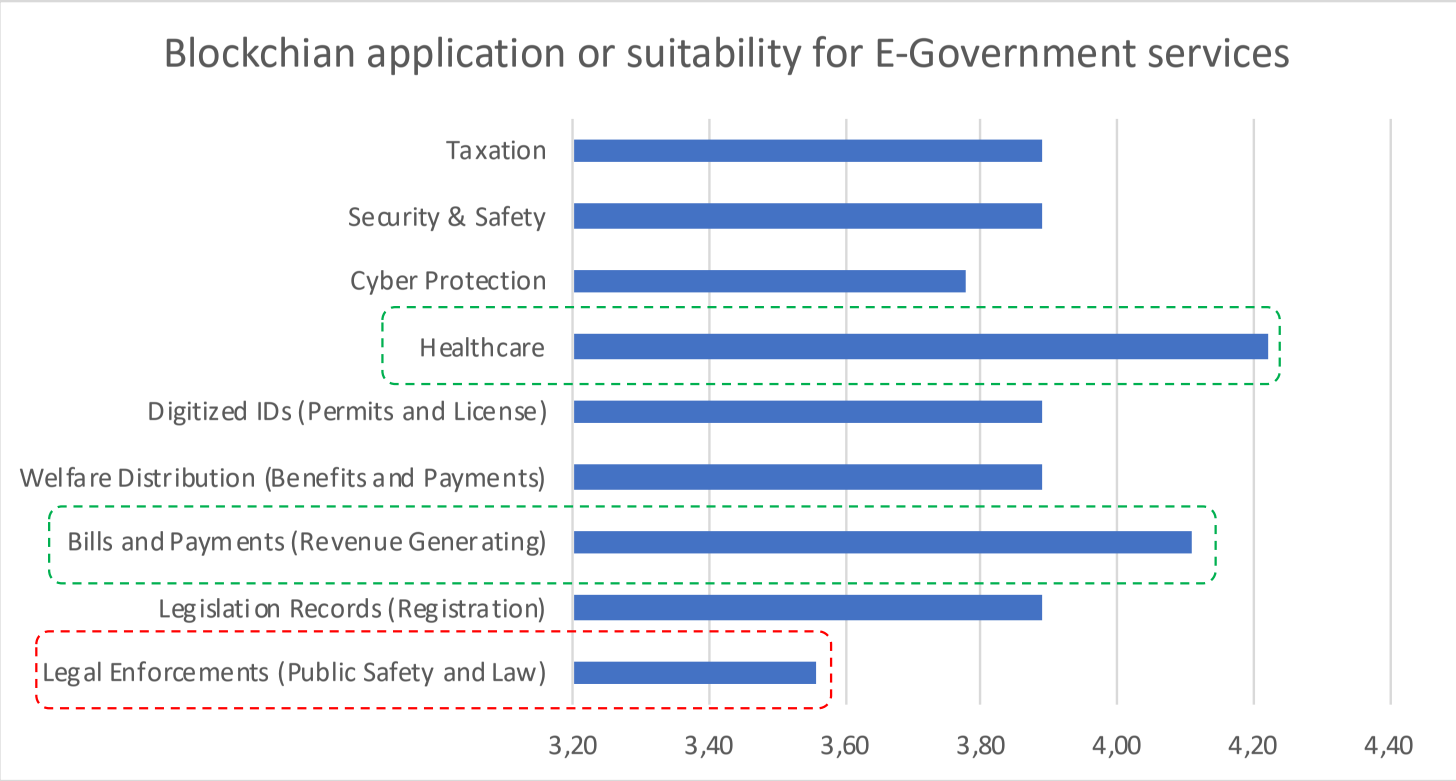
F.1 The regulations toward blockchain technology is still very low with less than 40% of ASEAN members has law related to blockchain for at some sort let alone other type of regulation tool as such decree, decision and notice with less than 20%

Blockchain application or suitability for E-Government services

Description	Average score
Legal Enforcements (Public Safety and Law): Government can use Public Blockchain data to monitor transaction to facilitate legal transaction and stop money laundering	**3.56**
Legislation Records (Registration): With decentralized ledger, Governments can keep a record of all the legislation reports in a better way	**3.89**
Bills and Payments (Revenue Generating): Governments can impose blockchain technology to improve the traditional billing and payment system	**4.11**
Welfare Distribution (Benefits and Payments): Blockchain technology can be a great way to cut off system losses which will pay the way for better welfare distribution	**3.89**
Digitized IDs (Permits and License): with decentralized ledger, Government can implement digital IDs for the citizens	**3.89**
Healthcare: Government can improve healthcare services by utilizing distributed legers	**4.22**
Cyber Protection: Government can use blockchain technology to protection vital Government infrastructure against cyber-attacks and hacks	**3.78**
Security & Safety with blockchain technology Government can provide better social security against online frauds	**3.89**
Taxation: with decentralized ledger, Government can foster better transparency solving tax issue	**3.89**

Responding 1 Strongly Disagree – 5 Strongly agree

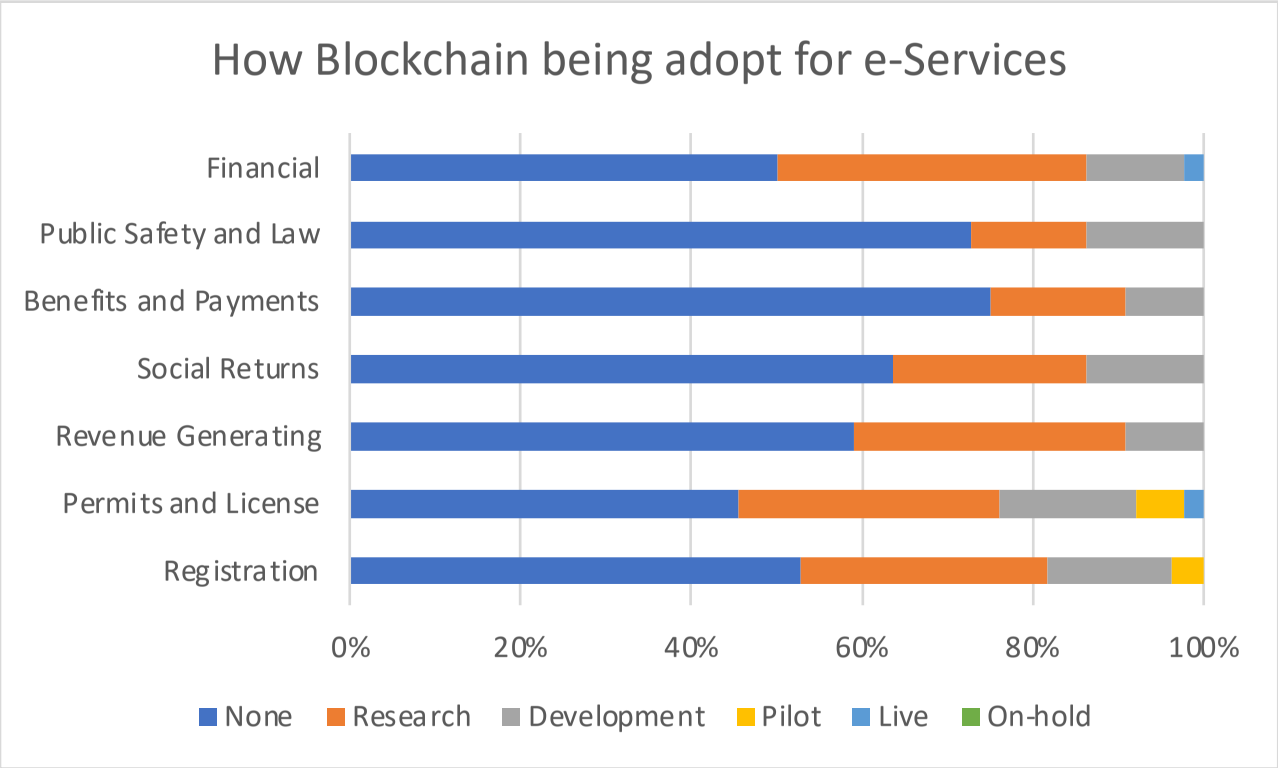
Blockchain application or suitability for E-Government services



Responding 1 Strongly Disagree – 5 Strongly agree

F.1 AMS in general agree that blockchain is suitable for e-government services. The Healthcare and Revenue generating e-services are the areas where AMS strongly believe that blockchain has the role to play. Healthcare score 4.22 the highest where blockchain distributed ledger can health improve how healthcare data is managed while Revenue generating e-services score 4.11. Nonetheless, it's quite surprise that AMS do not believe blockchain can improve the legal enforcements scoring lowest at 3.56.

Current status of Blockchain adoption in AMS



Responding Yes/No

F.1 Given that many of member state did not consider blockchain into their Previous ICT Master plan 2015-2020, there is no surprise that we see the adoption of blockchain into the government e-services remain very low with more than 50% not considering while only less than 30% remains in research, 10% in the development phase while less than 5% in pilot and ready for live.

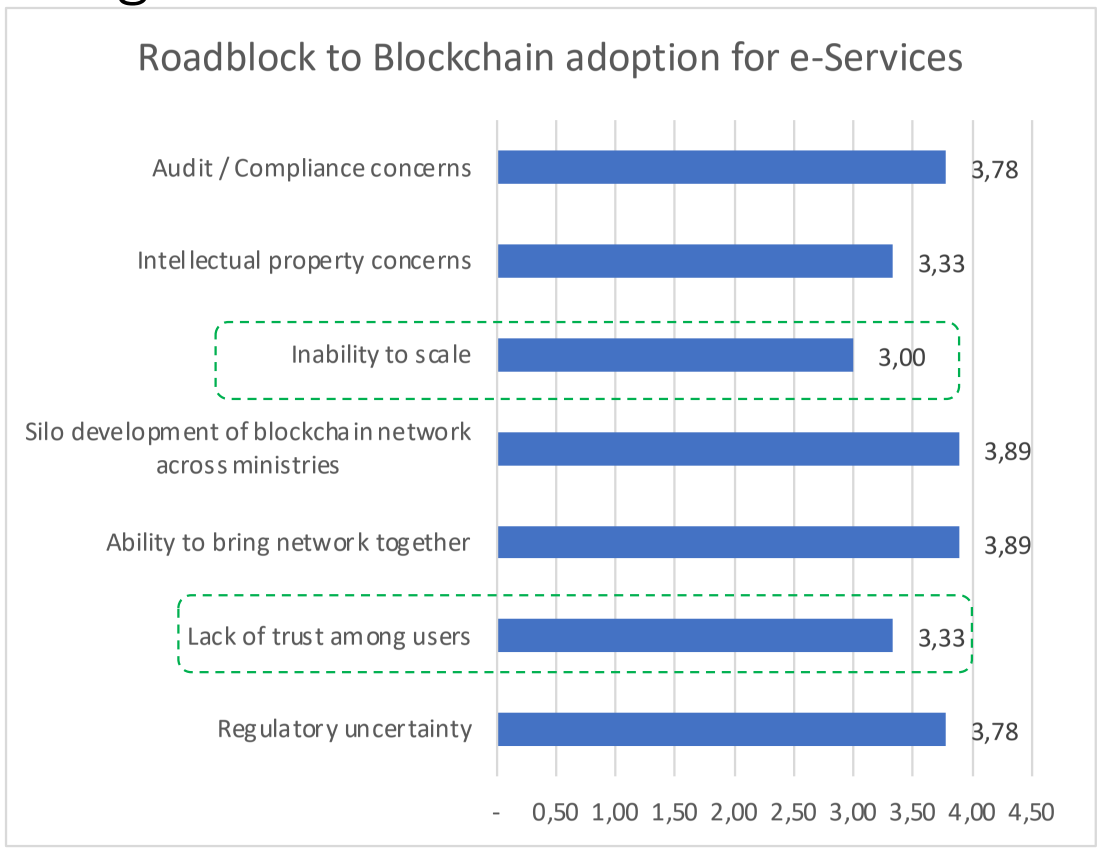
Applying blockchain in e-services by AMS

e-Services with Blockchain technology		Thailand	Malaysia	Singapore	Vietnam	Indonesia	Lao PDR	Mynmar	Cambodia
Registration	Public Identification								
	Birth / Marriage / Death Certification								
	Registration of new business								
	Vehicle Registration								
	Property titles								
Permits and License	Passport / Travel Document / VISA								
	Work Permit								
	Announce of Movement / Migration / Immigration								
	Medical Certificate and Medical Records								
	Driver License								
	Enrolment of Education and Education Certified								
	Professional Certification								
	Customs Declaration of Goods, Logistic Facilitation and Quarantines								
Revenue Generating	Online Import / Export Payment and Taxation								
	Government contracts and tenders								
Social Returns	Education Grants								
	Open Public Data								
Benefits and Payments	Migrants, refugees and visitors								
	People with disability								
	Veterans								
	Social Security								
Public Safety and Law	Complaints								
	Consumer protection								
Financial	Digital currency								
	Private shares								
	Insurance								
	Remittance								

Responding each stage

None	
Research	
Developmen	
Pilot	
Live	

What are the roadblocks for blockchain adoption in government e-services?



Responding 1 Strongly Disagree – 5 Strongly agree

F.1 The main roadblock to the blockchain adoption for e-service include Regulatory uncertainty, Ability to bring network together, the silo development, and the compliance concern (average 3.78+). This implies that it is actually the government policy rather than the technology itself that hinders the adoption of blockchain technology in the e-services.

The technology or the customer trust itself is only the smaller part of the picture as such inability to scale, intellectual property, and the lack of trust from users.

Technology limitation

Government policy, connectivities, compliances

Main challenges of blockchain development

Challenges	Improvement	Proposed Recommendation
Regulator and the government have a lot of work to catch up with the technology resulting in the delay of regal vehicle to regulate.	Capacity building, engage both private and public sector and bring in technologist to help regulator, build research center	There should be the working group for AMS to exchange knowledge
Due to the lack of knowledge, AMS policy remain silos and lack participation from stakeholders either public nor private sector.	Integrate blockchain into master plan, set up taskforce	AMS should streamline the involvement of private and public sector in order to accelerate the policy development
Performance, Interoperability, network access	Build standard, scale the technology, provide better access,	AMS might think of ASEAN blockchain network /ASEAN private blockchain
Lack of skilled resources leading to unstable operational cost	Work across the board to link skills, bring skills to general public, stabilize transaction fees, encourage more R&D	Shared infrastructure can help optimize scared resource. The AMS blockchain network might provide stepping stone for ASEAN blockchain and help stabilize the fees

Responding open opinion

Recommendations (TBA)

Objective

Compare blockchain technologies for government service's digital transformations to create trusted and transparent digital services for our citizens.

Output

O.1 Examine current status of how each government see blockchain in their national ICT vision

O.2 Evaluate blockchain technology trends of tools, standards, or communities that are likely to be suitable for digital government transformation especially those which are being considered in Japan and European Union

O.3 Compare blockchain adoption case studies in order to recommend different route that ASEAN policy makers can consider in leveraging the technology

Initial Finding

F.1 Blockchain has become more important to AMS ICT Master plan 2020-2025 where top management see it as integral part of the upcoming strategy and the technology itself is becoming mainstream

F.2 Majority of AMS agree that private sector should involve in the blockchain technology development for e-services

F.3 The regulating part is in more progressing stage where 56% claiming to have committee from public and private sector to look into the issue or having dedicate team drafting the blockchain standard and regulation

F.4 AMS in general agreement that blockchain is suitable technology for e-services

F.5 Healthcare, Revenue generating are the key areas where AMS believe blockchain can be most beneficial. Nonetheless, AMS do not believe that it will solve legal enforcement issues

F.6 The understanding of technology amongst AMS regulator remain very low; human resources are needed to assist regulators

F.7 The adoption of blockchain technology for government e-services remain very low with only less than 5% of the project live

F.8 Each continent adopt different approach in embracing the technologies. It's boiled down to 3 major "right to be forgotten", "business first, regulation later", "regulation first, business later"

Recommendations

R.1 AMS should set up working group to share ideas how to govern the blockchain

R.2 Propose to set up ASEAN blockchain nodes

R.3 AMS should streamline the involvement of private and public sector in order to accelerate the policy development

R.4 Shared infrastructure can help optimize scared resource. The AMS blockchain network might provide stepping stone for ASEAN blockchain and help stabilize the fees

R.5 Least developed countries, Cambodia, Lao PDR and Myanmar, have limited budget to develop ecosystem for blockchain

R.6 Human resource improvement among relevant ministries

Thank you

Discussion Q&A

Blockchain for ASEAN Digital Government

Piya Yuenyongsuwan
(Finema)

13th October 2021

" Blockchain allows any private or public section in the world to securely transact with any other without an intermediary. "

what is blockchain?

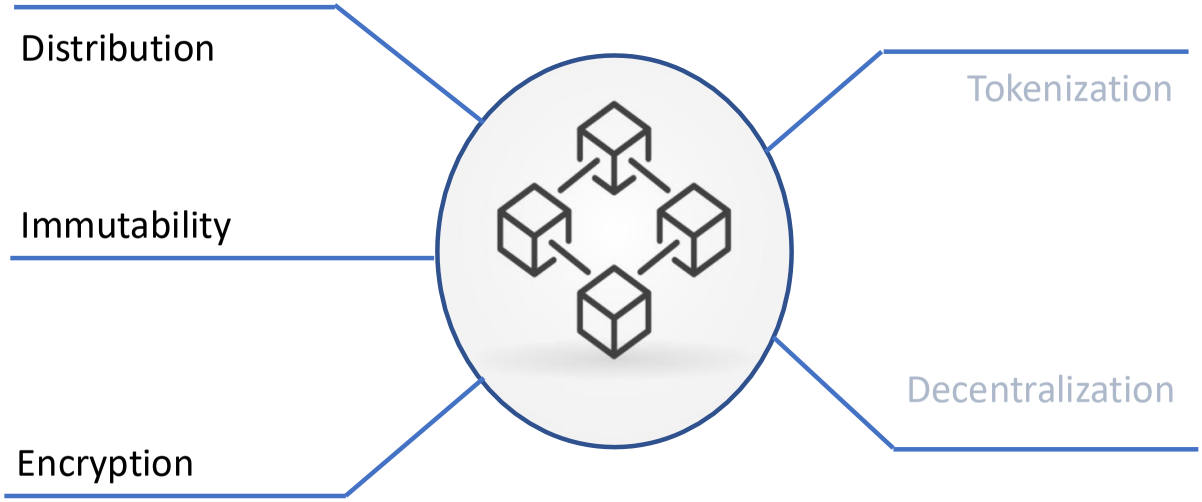
- Gartner predicts blockchain could generate as much as $3.1 trillion in new business value by 2030.

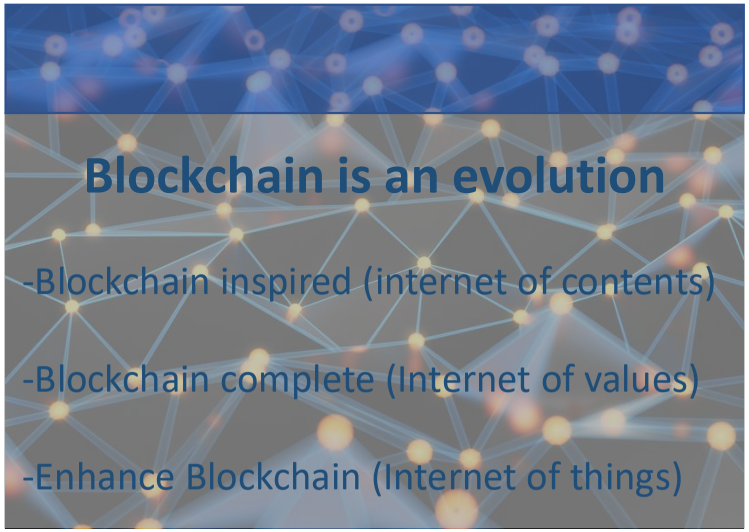
In its simplest terms, blockchain makes it possible for two or more people, businesses or computers that may or may not know each other to exchange value in digital environments without having an intermediary like a bank between them validating and protecting the transaction.

Technical Perspective and Evolution

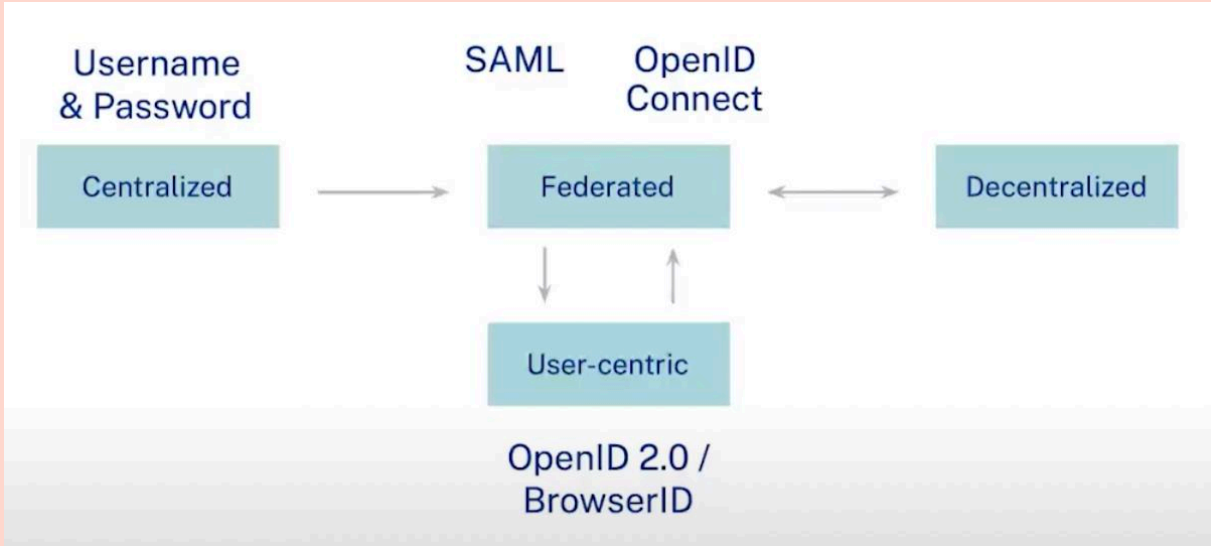
How blockchain works?

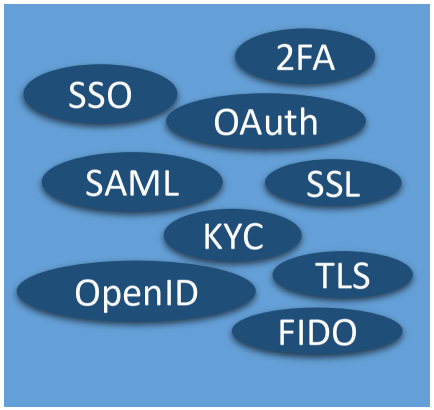
Blockchain enables trusted interactions between unknown participants by combining five design elements to authenticate users, validate transactions and record that information to the ledger in a way that can't be corrupted by a single participant or changed after the fact.

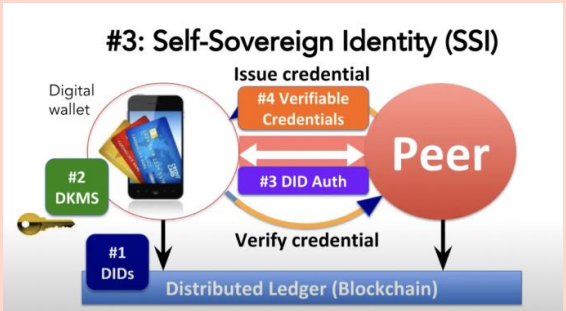




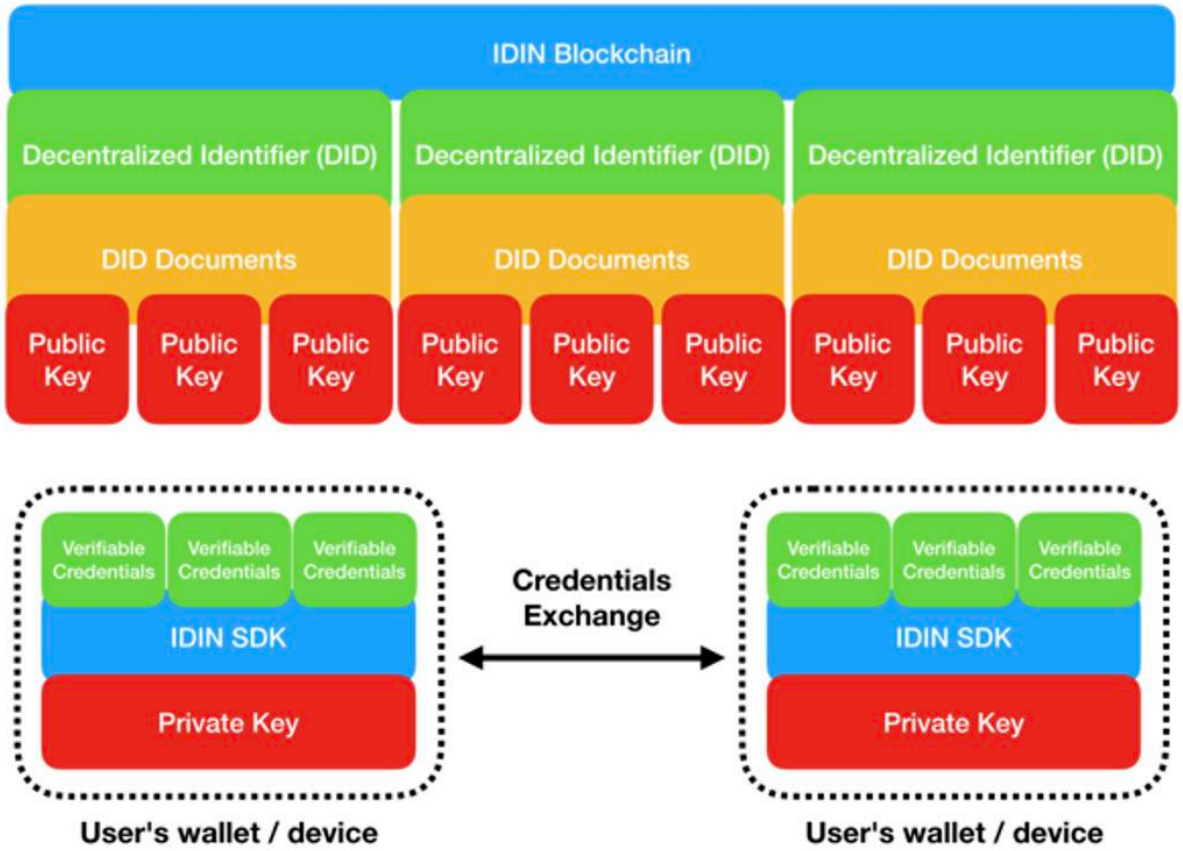
Evolution of Digital Identity







Benefit of blockchain



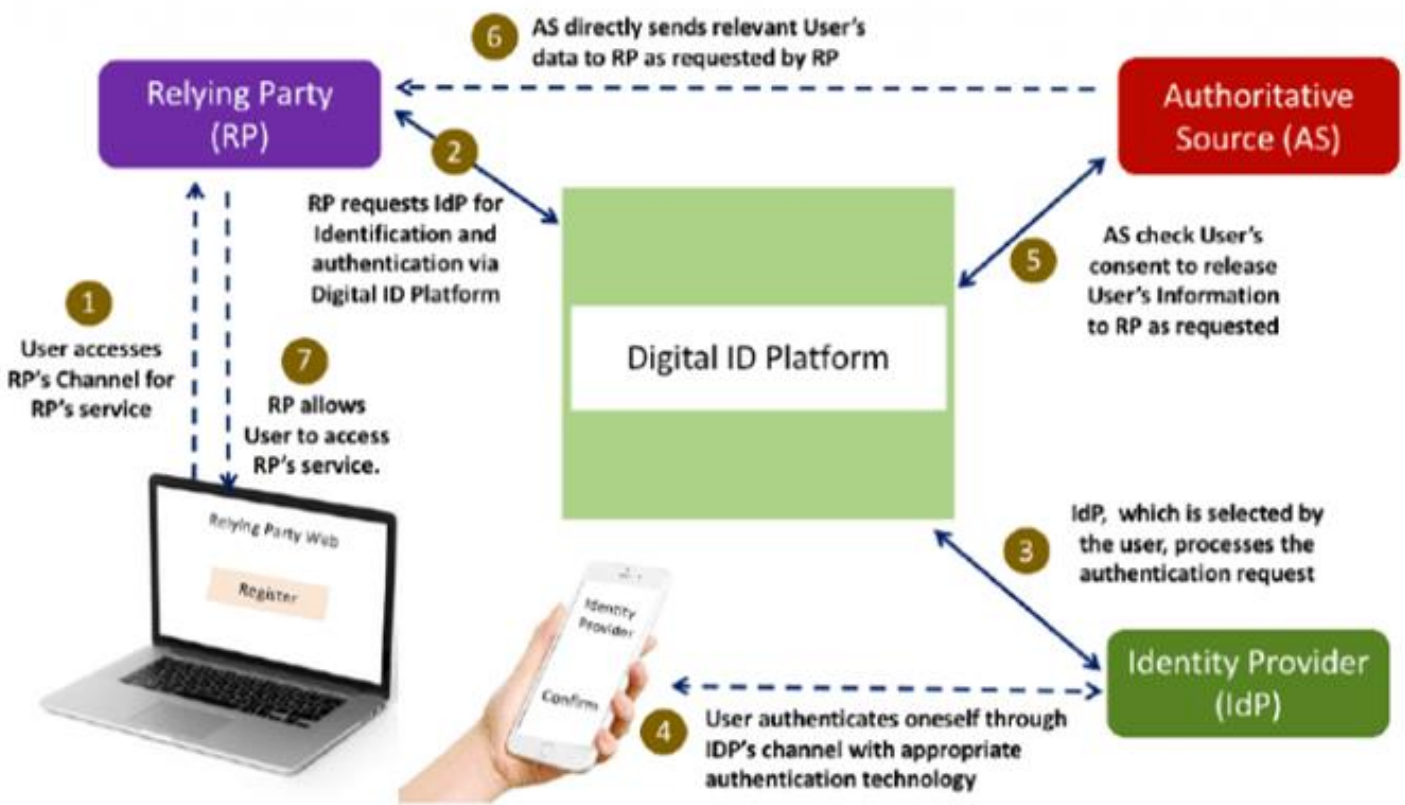
{ "Key": "Value" }

DID	DID Document
Decentralized Identifier	JSON-LD document describing the entity identified by the DID

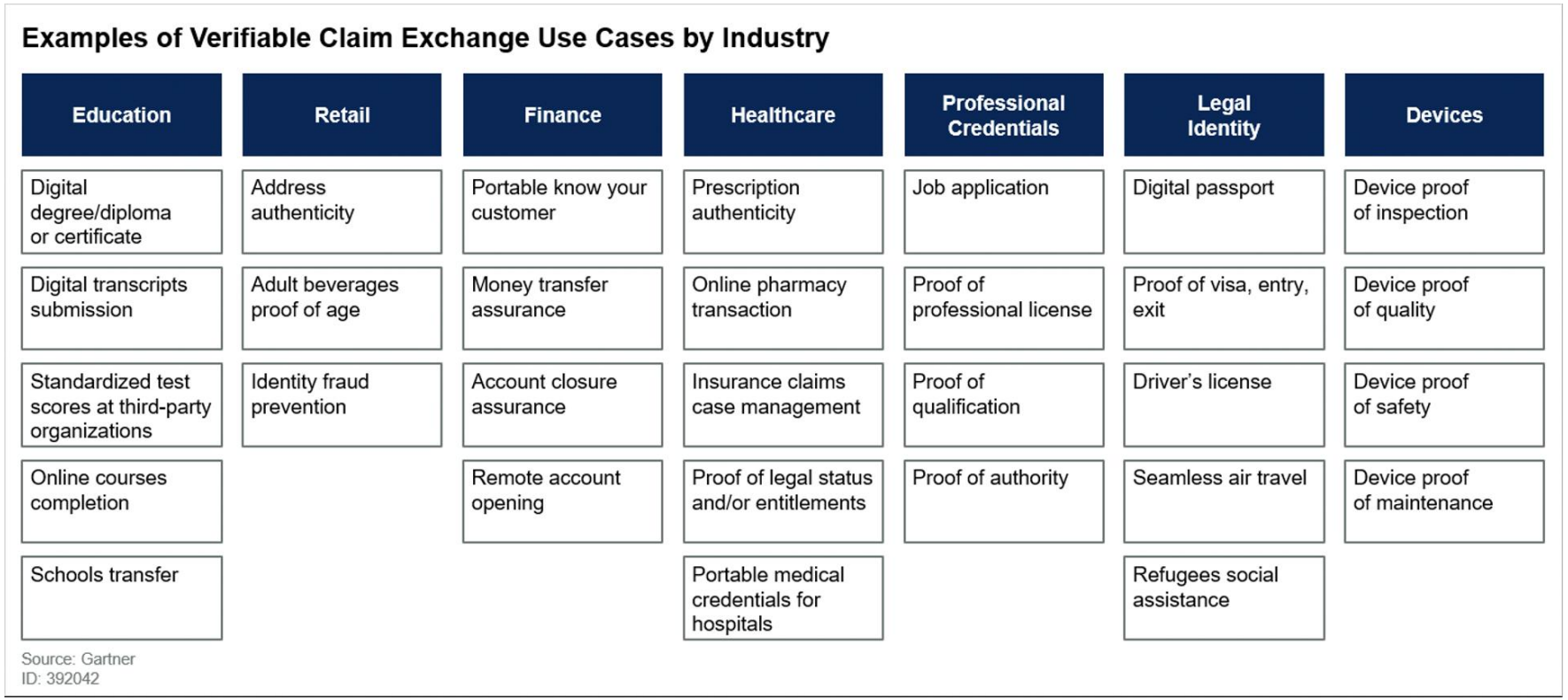
The standard elements of a DID doc

1. **DID** (for self-description)
2. **Set of public keys** (for verification)
3. **Set of auth methods** (for authentication)
4. **Set of service endpoints** (for interaction)
5. **Timestamp** (for audit history)
6. **Signature** (for integrity)

Digital Credential Exchange



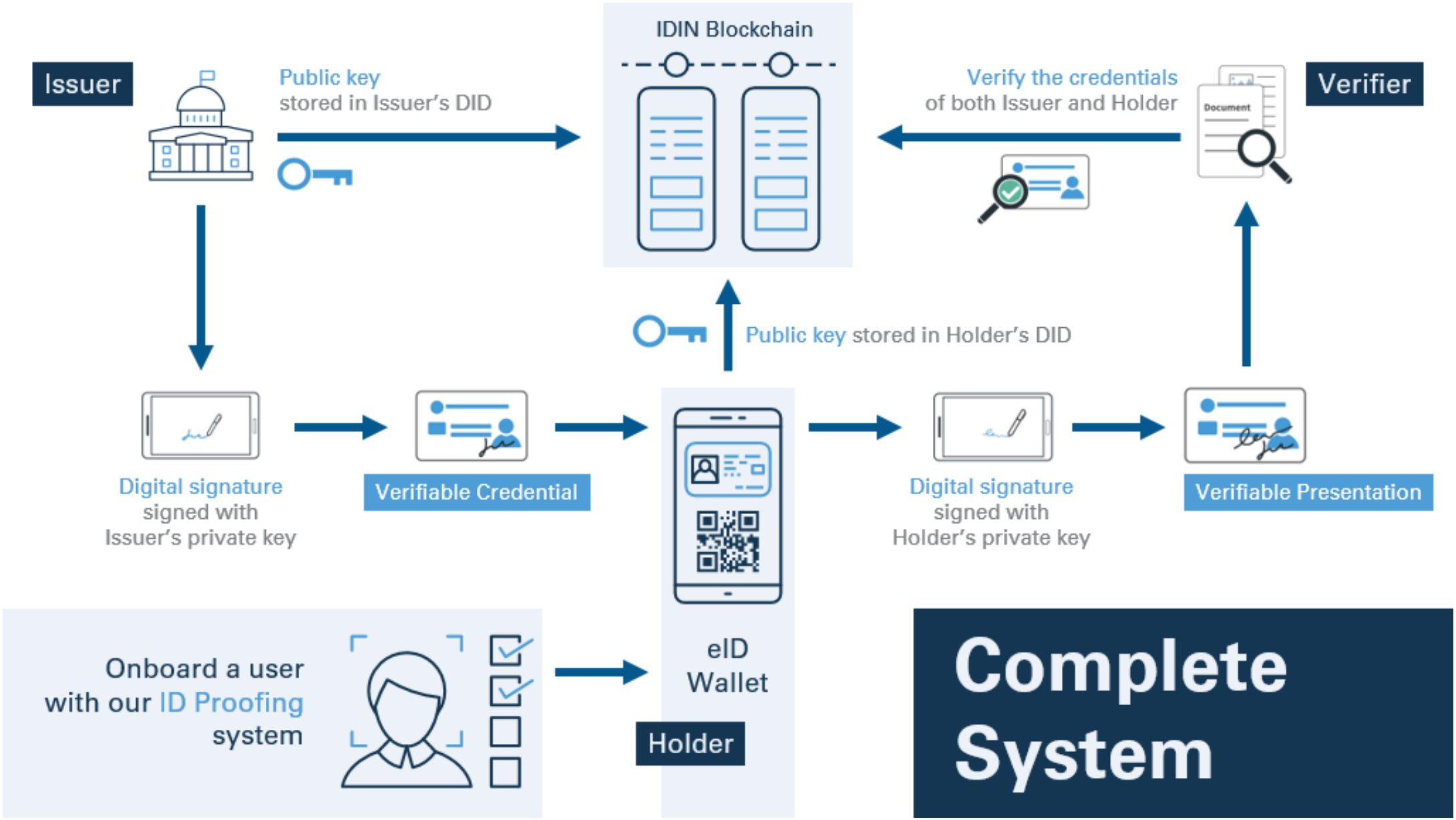
Benefit of blockchain and its application



Examples of Verifiable Claim Exchange Use Cases by Industry

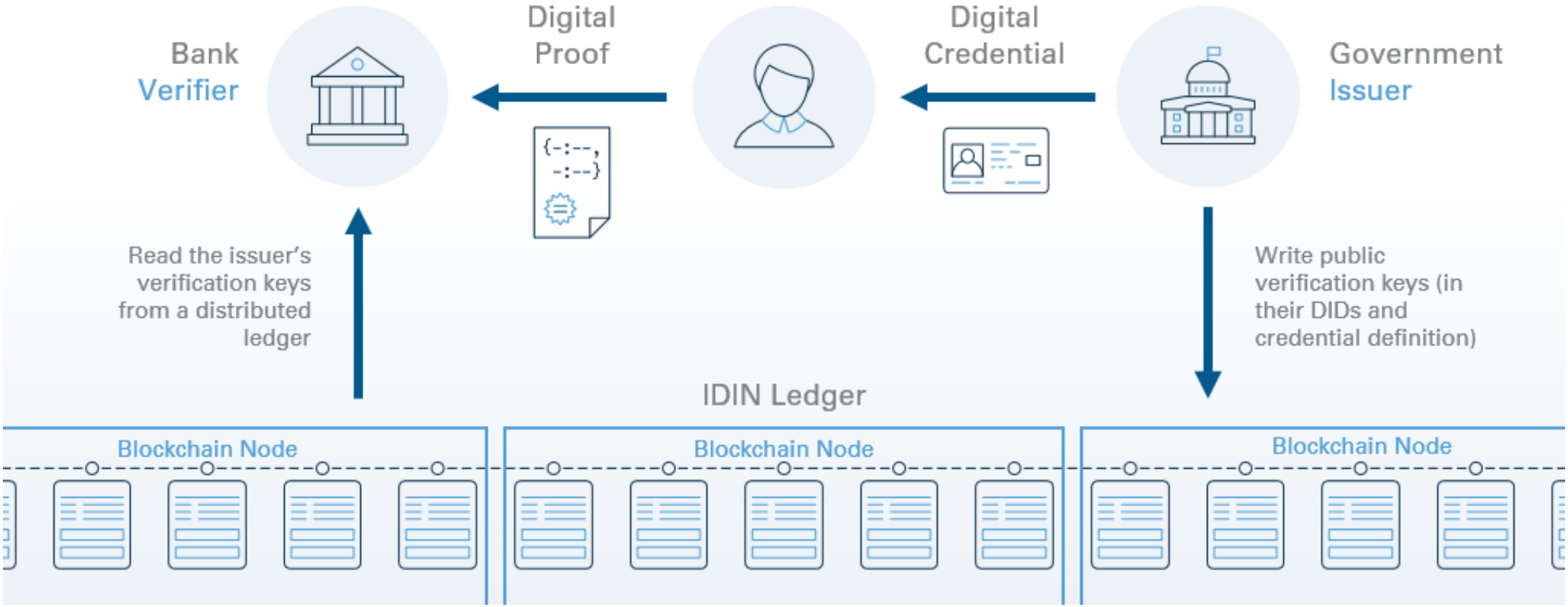
Education	Retail	Finance	Healthcare	Professional Credentials	Legal Identity	Devices
Digital degree/diploma or certificate	Address authenticity	Portable know your customer	Prescription authenticity	Job application	Digital passport	Device proof of inspection
Digital transcripts submission	Adult beverages proof of age	Money transfer assurance	Online pharmacy transaction	Proof of professional license	Proof of visa, entry, exit	Device proof of quality
Standardized test scores at third-party organizations	Identity fraud prevention	Account closure assurance	Insurance claims case management	Proof of qualification	Driver's license	Device proof of safety
Online courses completion		Remote account opening	Proof of legal status and/or entitlements	Proof of authority	Seamless air travel	Device proof of maintenance
Schools transfer			Portable medical credentials for hospitals		Refugees social assistance	

Source: Gartner
ID: 392042


IDIN Blockchain
Issuer
Public key
stored in Issuer's DID
Verify the credentials
of both Issuer and Holder
Verifier
Document
Public key stored in Holder's DID
Digital signature
signed with
Issuer's private key
Verifiable Credential
eID
Wallet
Holder
Digital signature
signed with
Holder's private key
Verifiable Presentation
Onboard a user
with our ID Proofing
system
Complete
System

Data Authenticity Can Be Verified

without contacting the issuer

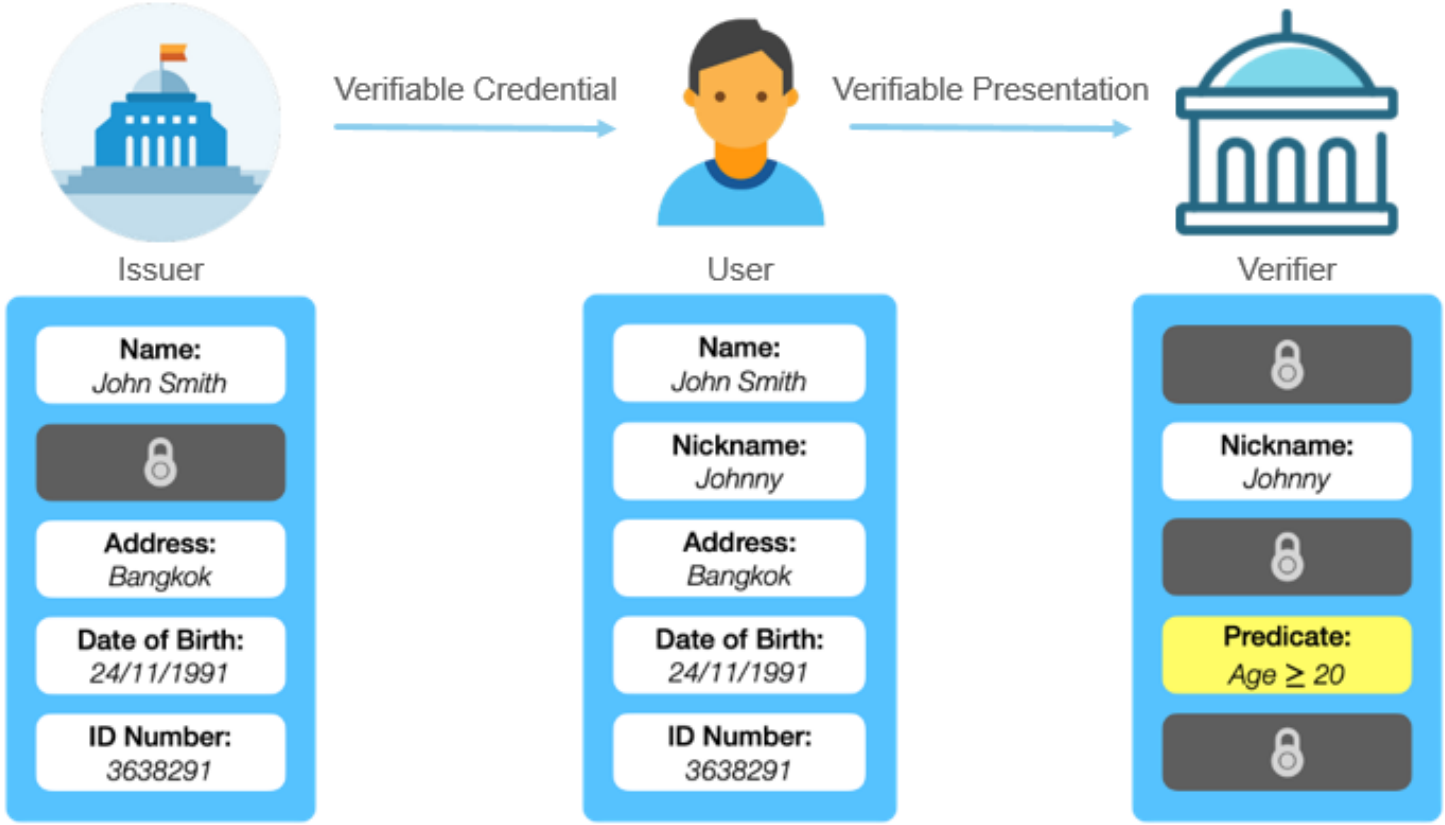


Passwordless Authentication

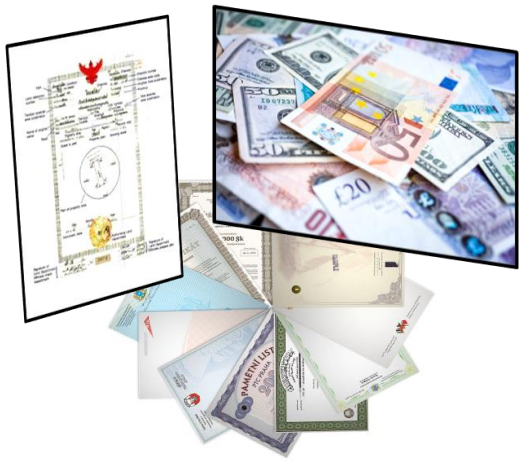
Our dPKI Approach

Attribute-Based Credentials

with Zero-Knowledge Proof



Generation of identity and authentication for Government.

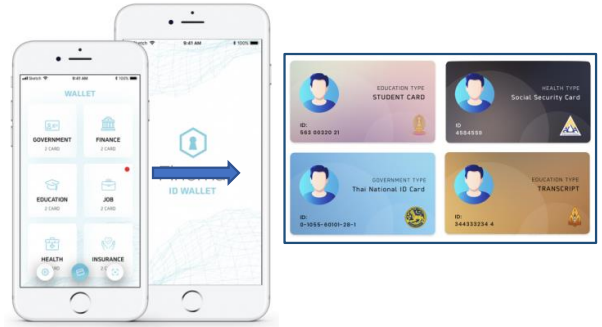


Security printing technique

- Banknote.
- Land Deed
- Birth or Any Certificates

Smart card with PKI

- Banking card.
- Transport card
- ePassport or NID



Digital identity by Blockchain

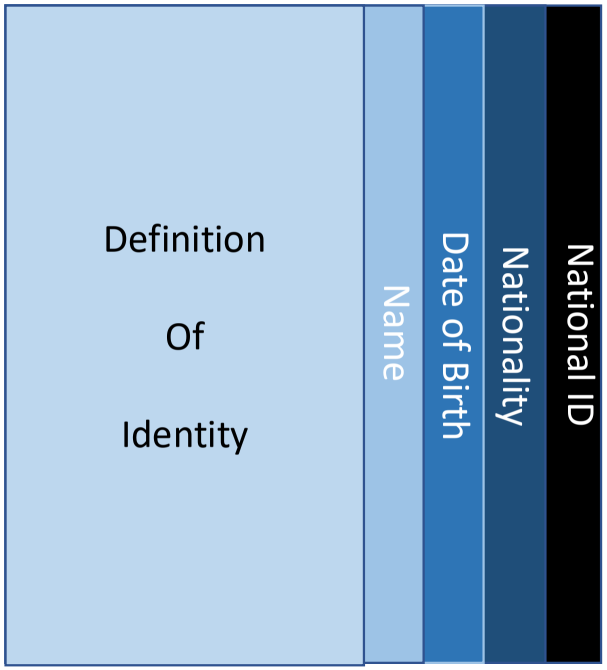
- Digital ID.
- Mobile Driver License
- Student ID

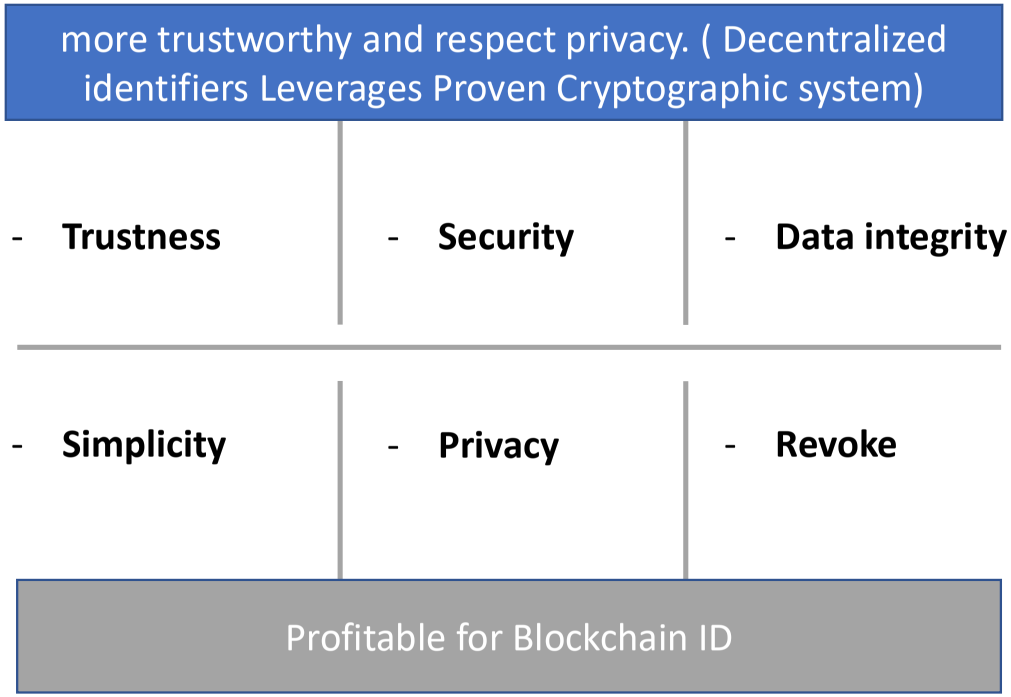
Comparison of traditional & Digital identity.

Blockchain contains the cryptograhy to approve the identity.

Traditional Identity	Digital Identity (Data privacy)
- Know Your Customer - Require access to identity data - Cost spending - Customer hassle	- eKYC - Limit access to identity - Cost saving - Un-duplicated

Why Digital ID suits and should be appled to blockchain for human being.





Use case examples of blockchain are used now.

mobileID

e-Estonia

" Estonia was the 1st Notion-state in the world to deploy Blockchain tech in production systime in 2012"

Zug Digital ID

"Decentralized identity Ethereum platform to create the world's 1st live implementation of a SSI in 2017"

ksi blockchain

Zug ID

mobileDL

Major component (ISO/IEC DIS 18013 – 5)

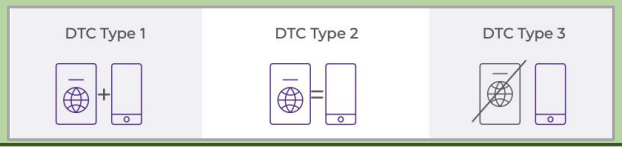
- Issuer
- Holder
- Verifier

ICONLOOP

IDEMIA

DTC

Taking seamles travel one step while security and privacy



IDEMIA

KTDI Known Traveller Digital Identity

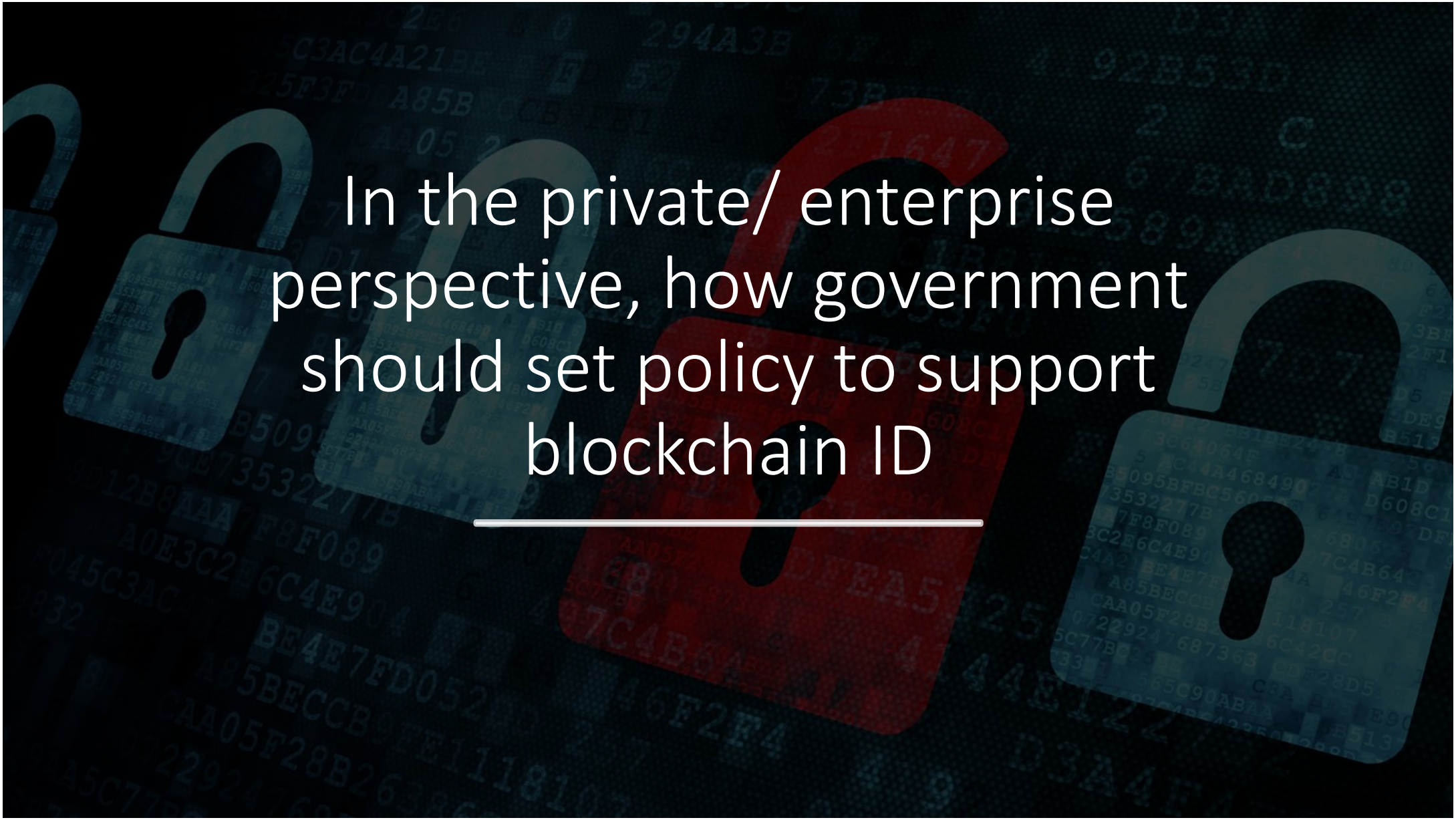
HealthPass

Digital Health Certificate needs for cross border

- International standard platform
- Vaccine type and vaccinated information
- Secure and privacy of holder information

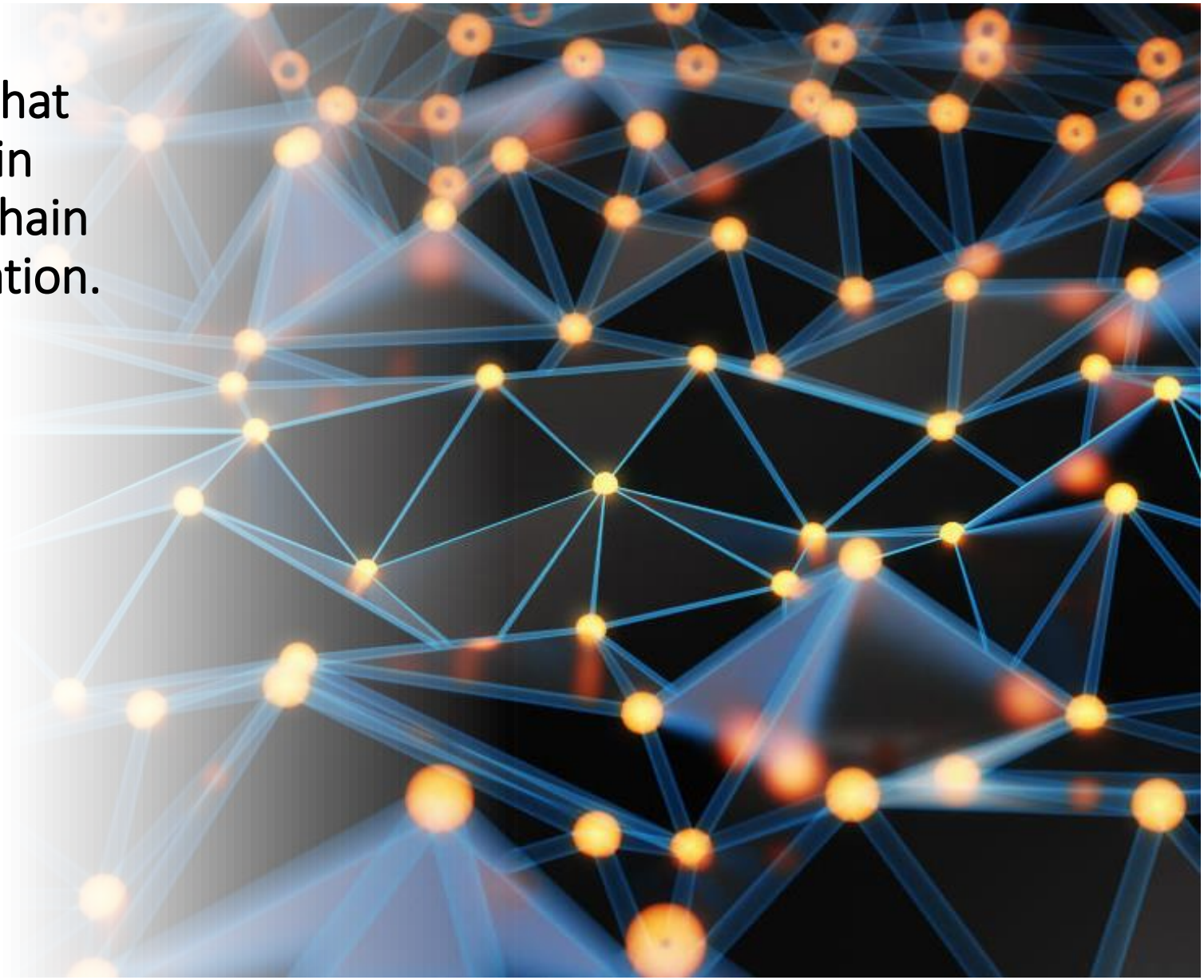
HealthCerts

Blockchain Labs


In the private/ enterprise perspective, how government should set policy to support blockchain ID

What is the action that ASEAN should take in next step for blockchain technology cooperation.

- Digital Driver License
- Digital Health Pass
- Border crossing



Blockchain for ASEAN Digital Government

Piya Yuenyongsuwan
(Finame)
13 October 2021

Thank You
Q & A

Blockchain Technology and Possible use cases in Lao PDR

By: Virasack VIRAVONG

@ Online Workshop on Blockchain for digital government – the ASEAN way

Vientiane, Lao PDR 13 October 2021

LAOITDEV

Topics

1. About Lao IT Dev
2. Do we need blockchain?
3. Challenges in blockchain
4. Identifying a blockchain use case
5. Blockchain Technology
6. Blockchain basic concept demo
7. Blockchain Technology adoption and possible use cases in Lao PDR

About Me

Virasack VIRAVONG (ວິຣະສັກ ວິຣະວົງ)

Co-Founder and CEO Lao IT Development Co., Ltd

Vice Executive President of Lao ICT Commerce Association (LICA)

Email: virasack@laoitdev.com

Mobile: +85620 58873055

www.laoitdev.com

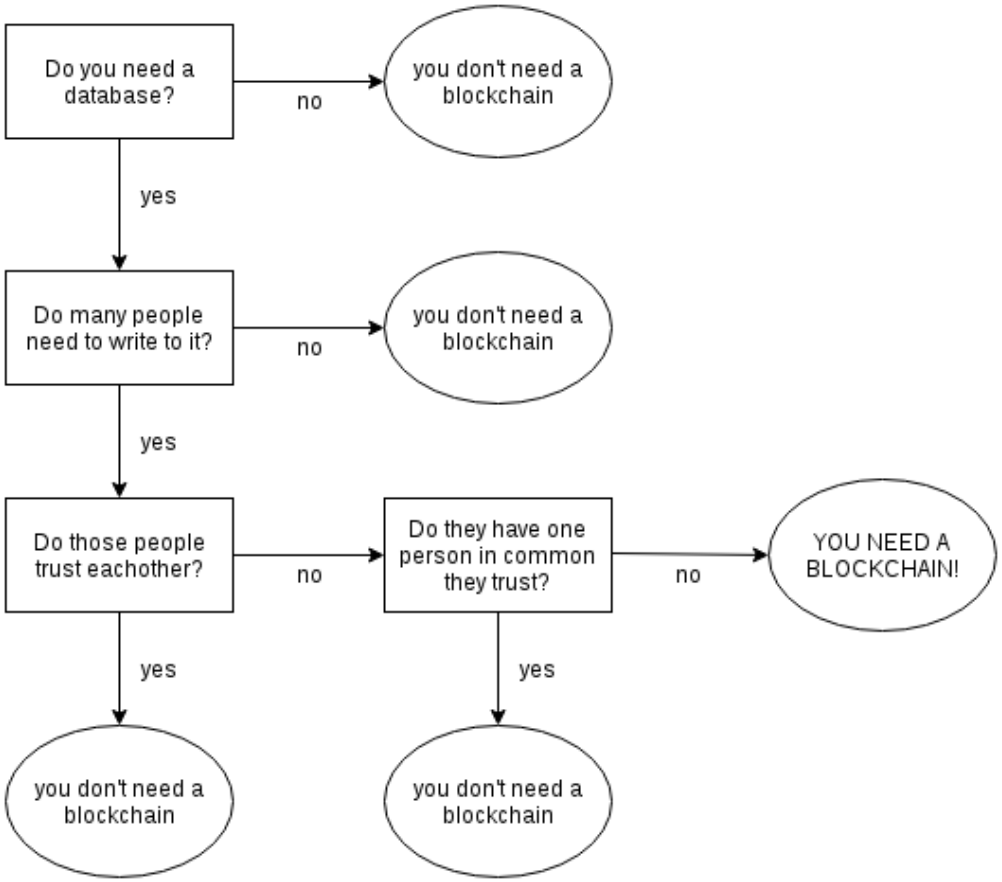
About Lao IT Dev

Lao IT Development Co., Ltd. or in short Lao IT Dev is a private company formed in December 2010, offering IT solution services. We are among the best and most innovate developer companies in Laos, we always thrive for the highest quality, to develop and to become better. Our company is trusted by many sectors both government and private for delivering high quality and efficient products.

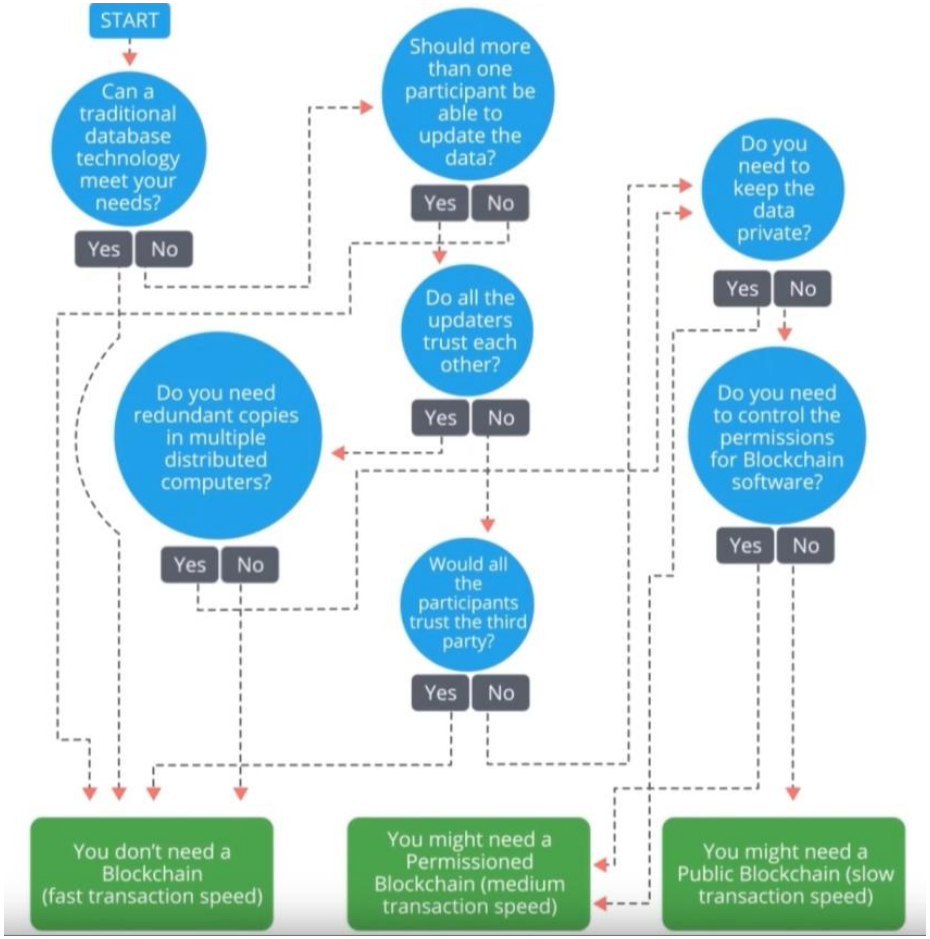
About Lao IT Dev

Web Services Web App Development	Mobile Application Development	UI and UX Design Services	System Integration
DevSecOps Services	Cyber Security	Data Science Solution	Blockchain Development

Do We Need Blockchain?



When to use Blockchain?



Challenges in Blockchain

Initial Cost

Integration with Legacy Systems

Energy Consumption

Public Perception

Privacy

Identifying a Blockchain Use Case

- Business Model
- How many writer/updaters are there?
- How many participants hold the nodes?
- Can all participants trust a 3rd party?
- Does the data need to be kept secret? (Data Privacy)
- Performance

A business problem

An identifiable network

A need for trust

What is Blockchain?

IMMUTABLE

- Immutable means if you put something on blockchain it's really hard to change

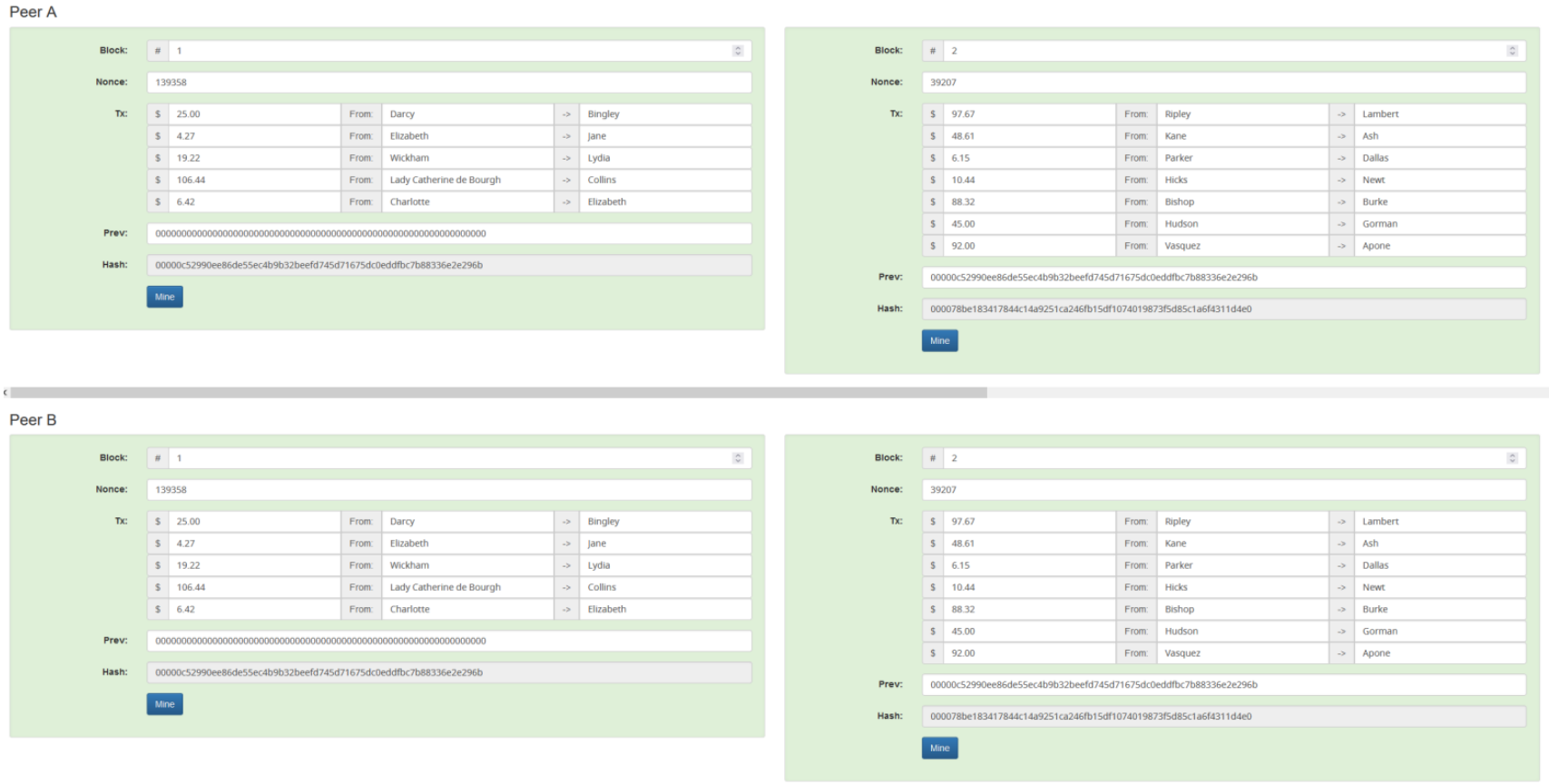
DISTRIBUTED

- Distributed means no one computer can't decide it's a network of computers around the world sharing that decision

LEDGER

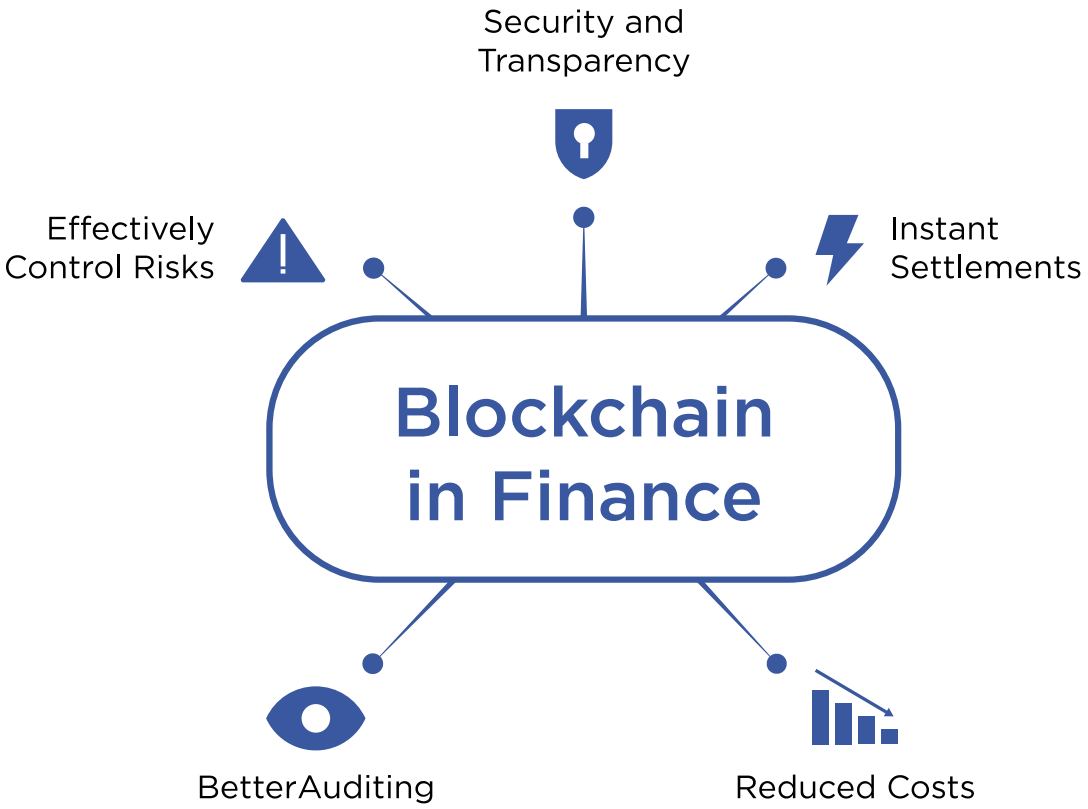
- Ledger is just a table that contains a lot of information

Blockchain Demo

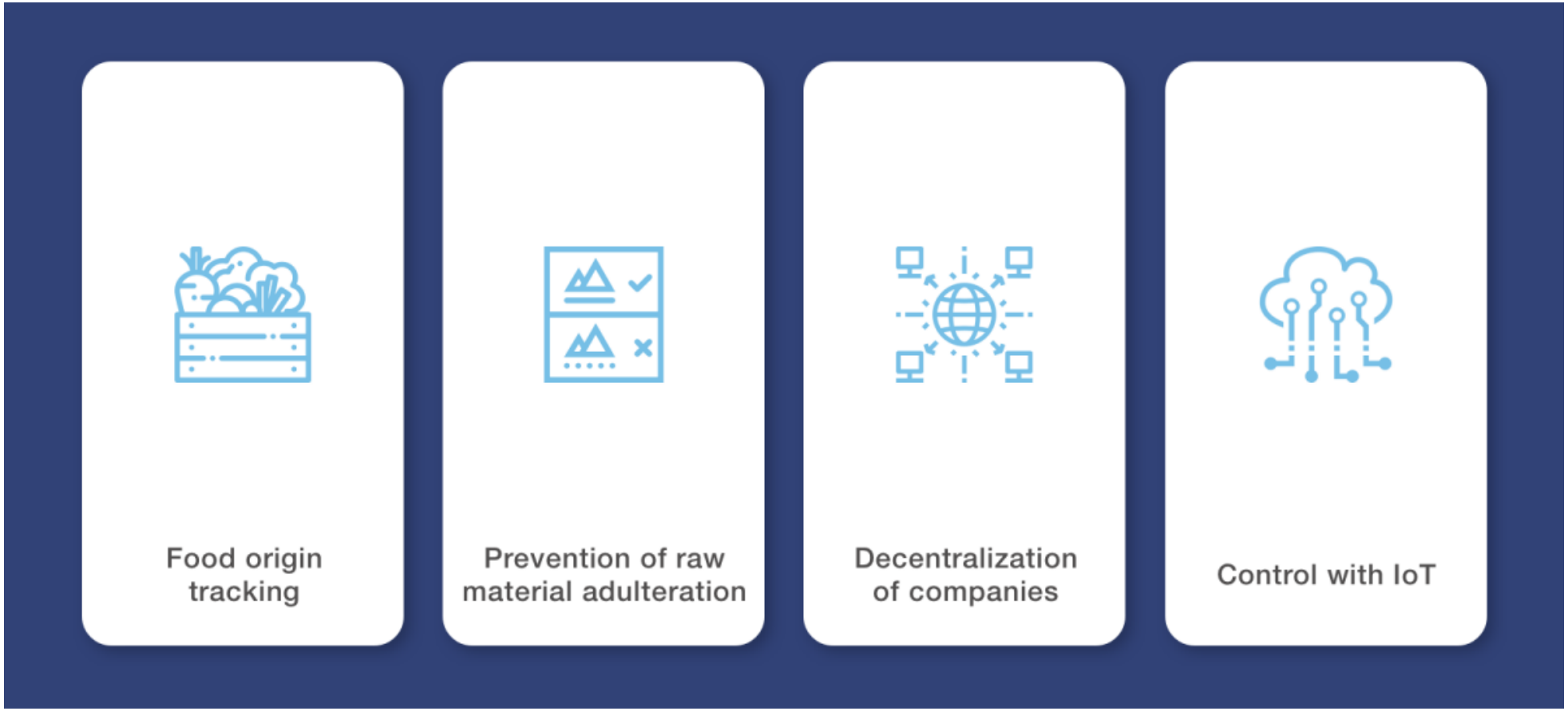


Playing demo link: https://andersbrownworth.com/blockchain/hash

Blockchain Use Cases in Lao PDR



Blockchain Use Cases in Lao PDR



“Understanding the Business First, Technology Second”

Thanks!

Q & A

TEL: (+856-21) 562905
ADMIN@LAOITDEV.COM
www.laoitdev.com
179 Vatnak Village, Sisuttanak District, Vientiane Capital, Laos 01000