CYBER SECURITY SHARING PLATFORM: INDONESIA APPROACH IN LAW ENFORCEMENT OF FINANCIAL TRANSACTION CRIMES

Deni Kamaludin Yusup, UIN Sunan Gunung Djati Bandung

ABSTRACT

The paper aims to analyze the Indonesian government's efforts in overcoming various criminal acts of financial transactions that have become prevalent in the last decade. On the one hand, information technology systems have provided multiple benefits for the community, especially business people, to develop their businesses. On the other hand, it has also been misused by certain parties to share criminal acts, such as fraud, bank, and credit card break-ins, selling personal data, and even money laundering. The method used in this research is juridical-normative and qualitative approaches. This study concludes that the cyber security sharing platform is an effort made by the Indonesian government to regulate, supervise, prevent, prosecute, and protect all forms of financial transactions. Created as the implementation of several government regulations regarding cyber security systems and has proven successful in suppressing and reducing digital-based financial transaction crimes in Indonesia. The urgency of implementing a cyber security sharing platform is to protect data and various important informations and have a cyber security sharing platform to share information about cyber threats and mitigate cyber incidents. The Cyber Security Sharing Platform concept will be realized, one of which is by strengthening regulations and stakeholder commitments in the enforcement of illegal financial transactions.

Keywords: Cyber Security, Regulation, Law Enforcement, Financial Transaction, Crime.

INTRODUCTION

In recent decades, Indonesia had a high potential for digital transactions when compared to other ASEAN countries (Pangestu & Dewi, 2017). The results of a study from Google, Temasec, and Bain & Company in 2020 show that Indonesia is the country with the highest digital economic transaction value in the region, reaching US$ 44 billion, and is predicted to reach US$ 124 billion in 2025 (Sitanggang & Winarto, 2020). Therefore, there must be a central financial institution that monitors digital transactions, which has a role and duty as a regulator to oversee digital-based financial transactions in Indonesia. The purpose of the establishment of the institution is to monitor and detect potential risks that can arise so that they can be immediately addressed when problems occur (Rasyida, 2020).

A regulator can be present to oversee all digital-based financial transactions, from detecting the number of digital transactions in circulation to recording in financial reports, so that transaction traffic and its value can be indeed known and reported in detail by all financial

Citation Information: Yusup, D.K. (2022). Cyber security sharing platform: Indonesia approach in law enforcement of financial transaction crimes. *Journal of Legal, Ethical and Regulatory Issues, 25*(2), 1-22.

institutions in Indonesia (Prawirasasra, 2018). Through this mechanism, the government can oversee every digital financial transaction, preventing and overcoming cybercrimes that occur in the financial system in Indonesia. The main goal of this policy, of course, is to protect consumers and local businesses from various cyber crimes that may occur in digital-based financial transactions, from the background to the law enforcement process (Hidayat, 2020).

For instance, President Joko Widodo recently emphasized that eradicating money laundering is very important to maintain the integrity and stability of the economic system and financial system stability during the Covid-19 pandemic and national economic recovery (Rahman, 2020). He urged that all stakeholders of the anti-money laundering and prevention of terrorism financing regimes have to continue to anticipate developments and conditions that could disrupt the integrity and stability of Indonesia's economic system and financial system (Vishnum, 2020). He also says that this is related to the government's efforts to fix the shadow economy, including dealing with various economic crimes more effectively, especially cybercrimes that exploit technology. At least several government institutions in Indonesia have the authority and duty to oversee criminal acts of digital-based financial transactions, such as the Supervisory and Regulatory Agency (LPP), Law Enforcement Institutions, and the Center for Financial Transaction Reports and Analysis (PPATK) as financial intelligence institution. (Suwiknyo, 2021).

The most exciting example of the implementation of a cyber security system in Indonesia is the handling of money laundering cases, which aims to find and prosecute individuals or corporations as perpetrators, also focused on finding and taking action against assets related to the crime of money laundering (Adiwijaya, 2020). Therefore, the regulation in Law Number 8 of 2010 on the Crime of Money Laundering has an instrument of delaying transactions and blocking related to assets suspected of being related to the crime of money laundering (Atikah, 2020). In addition, Law Number 8 of 2010 also does not require initial proof of a predicate crime or a mechanism for reversing the burden of proof. This difference needs to be understood by the law enforcers when processing and adjudicating money laundering cases in Indonesian law (Nugroho et al., 2020).

In the anti-money laundering regime in Indonesia, there is a shift in the way in which the law is enforced, namely if in the criminal justice process the focus is generally on “*suspects*” as individuals or corporations, in the anti-money laundering regime, the focus is on “*money*” or “*assets*.” This shift is often termed as "*from follow the suspect to follow the money."* The object of the Crime of Money Laundering is not only “*Persons*” but also “*Assets*.” (Husein, 2003). This is something that the Criminal Code has not fully accommodated. Law Number 8 of 1981 on Criminal Procedure Law defined investigation as a series of actions of investigators in terms of and according to the method regulated in this Law to seek and collect evidence which with that evidence makes clear about criminal acts that occurred and to find the suspect (Nuryanto, 2019).

It should be underlined here that the orientation of investigations in Indonesia is also still focused on searching for “*people*” who are suspected of committing criminal acts. This is influenced by the understanding of the purpose of punishment in the Indonesian legal system. In this context, the Criminal Code, which still adheres to a punishing experience, where the purpose of imposing a sentence is retaliation for mistakes made through corporal punishment (Harahap, 2020). Based on this understanding, it will undoubtedly be challenging to take action against assets known to be related to crimes, but to be processed which they must first find and be found guilty of the "*owner*" of the purchase. Therefore, in giving legal sanctions to perpetrators of money laundering crimes, the concept should be changed from *"follow the suspect*" to "*follow the money"* (Kurniawan, 2012).

To support the change in the concept, sequestration and confiscation mechanisms in handling money laundering offenses are an integral part of efforts to reduce crime rates (Girsang, 2014). However, this is one of the many different concepts in terms of handling money laundering offenses. In addition, to cover these deficiencies, Law Number 8 of 2010 on the Prevention and Eradication of the Crime of Money Laundering, the Regulation of the Indonesian Supreme Court Number 1 of 2013 on Procedures for Settlement of Applications for Handling Assets in the Crime of Money Laundering or Other Crimes, and other provisions to regulate and facilitate the handling of money laundering crimes (Akbar, 2019).

Research related to the Cyber Security Sharing Platform in law enforcement of financial transaction crimes is rarely carried out, especially in Indonesia. This is the researchers' idea to use this concept to assist the Indonesian government in enforcing criminal acts of financial transactions. So that in this study, there is no relevant previous research that can be used as a basis for the usefulness of this concept. There are many studies related to money laundering crimes, especially in Indonesia. However, there has been no research associated with the crime of money laundering, solving the problem using a technological approach. This research is the beginning of the technology sector's contribution that can be integrated into the field of legal studies, especially those related to financial transaction crimes. Therefore, the purpose of this study is to explain the role of the Indonesian government to focus on developing a cybercrimes security system in the national economic and financial system through the Cyber Security Sharing Platform as an Indonesian approach in monitoring financial transaction crimes in line with the national roadmap related to the development of Indonesian financial markets.

RESEARCH METHOD

The method in this study uses a normative juridical approach. The research specification in this study used by the researcher is descriptive research, which is a study that provides data as accurately as possible about humans, their circumstances, or symptoms. The purpose of this research is to describe an object systematically. The sources of data that the researcher uses in this study include:

1. Primary Data, which is the leading data needed in the study which comes from Law Number 8 of 2010 concerning Prevention and Eradication of the Crime of Money Laundering, Regulation of the Supreme Court of the Republic of Indonesia Number 1 of 2013 concerning Procedures for Settlement of Applications for Handling Assets in the Crime of Money Laundering or Other Crimes, and other provisions to regulate and facilitate the handling of money laundering crimes;
2. Secondary Data is data that accompanies as well as complements primary data. This data is obtained from the results of library research originating from 3 (three) legal materials, including a) Primary legal materials, legal materials that have a binding nature such as applicable laws and regulations and are related to the problems in this research; b) Secondary Legal Materials, which provide information related to previous legal materials, namely primary legal materials; 3) Tertiary legal materials, namely

complementary legal materials to provide a deeper description and information related to primary legal materials and secondary legal materials.

The technique that researchers use for research data collection is the literature study data collection technique. Following the approach method used, the data obtained for the writing of this research will then be analyzed using qualitative normative analysis in the sense that the data that has been accepted will be arranged systematically for further qualitative analysis.

RESULTS AND DISCUSSION

Understanding Cyber Security System

Cyber security protects systems connected to the internet, including hardware, software, and data from cyber-attacks. In computing, security consists of cyber security and physical security, which companies use to protect their data centers and computer systems against illegal access. Information security, which is designed to maintain the confidentiality, integrity, and availability of data, is part of cyber security (Von Solms & Van Niekerk, 2013). Cyber security is a process or practice carried out by individuals, organizations, or companies to protect their devices, networks, programs, and data from malicious digital attacks. In practice, this sense includes various efforts such as installing firewalls, applying multi-factor authentication, using secure wifi networks, making data backups, and other things that can prevent cybercriminals from accessing computers, networks, or sensitive information on a person or an institution (Stevens, 2016).

The cyber security system is also a field that continues to change and develop from time to time. This is much influenced by the rapid advancement of technology, in this system, the introduction of various new devices, and the increasing quality and quantity of anti-cybercrimes. In other words, the success of the cyber security approach will be significantly influenced by your success in creating a solid defense system (Craigen et al., 2014). Well, the best way is to set up a layered layer of protection to ensure that you will stay safe while surfing the internet. Especially in the digital era like today, everyone is very dependent on technology. Starting from the individual level to government institutions, they all use the internet to transfer data then store their valuable information on various devices. However, both systems and networks often have security holes that hackers can exploit (Shafqat & Masood, 2016).

In many cases, the attackers continue to innovate and develop many types of applications to carry out digital attacks that are more massive and very difficult to detect. Based on these reasons, the concept of cyber security is not simple, and because the episodes tend to evolve every day as attackers become more inventive, it is imperative for Internet users to properly define the concept of cyber security and identify what good cyber security looks like (Ziccardi, 2020). Thus, implementing an effective cyber security system is now a must to increase system or network security to reduce the risk of cyber-attack threats. Although the main challenge today is quite a lot of information technology companies offering programs to anticipate malware as a publicly available commodity that can make it easier for anyone to become a cyber attacker or anti-cyber attacker, and maybe even more companies that offer fake security solutions and do little to defend against cyber attacks.

Cyber Security System Function

Today, many IT experts and CEOs know that cyber security systems must be protected more strongly against hacker attacks. They have seen statistical data, such as a company that went bankrupt due to ransomware attacks in just 14 seconds. They are also all increasingly aware that a single attack can cause a business to stagnate, and even worse, bankruptcy. If a company only sees a cyber security system as an additional budget for IT infrastructure, of course, it will be worth the impact and benefits (McIntosh, 2015).

Cyber security systems have proven to play a vital role in the growth of a company's business. For example, according to a survey in 2014, 84% of consumers are apathetic when their data is taken when they are buying something on the internet. But now the situation is very different, which according to research conducted by Vodafone recently showed 89% of company stakeholders agree that increasing cyber security systems based on the consumers feel more loyal and trust the company (Benzie, McCarter, & Ko, 2014). The important thing here is business partners and potential investors also want to ensure a company has a high level of security before building or sharing data (Kouttis, 2016).

There are at least three reasons why a business company needs a robust cyber security system that will have an advantage over competitors who have the opposite view, such as: first, the cyber security system is essential to develop company strategy. A robust cyber security system will create a foundation for the company for other methods such as migrating data and applications to the cloud and expanding its business wings more broadly; second, a cyber security system is essential for individual data access. In this case, any personal data that has been inputted into the database and stored in the data bank becomes a reference source of information that can be used to conduct business contracts with other individuals or between individuals and companies; third, the cyber security system is essential for exchanging data between institutions. Interconnection through the internet network is currently very easily accessible, and of course, it is very vulnerable to hacker attacks. Thus, some institutions require the sharing of information related to user data (Baldassarre et al., 2019).

In addition, the function of the cyber security system is commonly used by every business institution today to protect all user data safely. The use of a cyber security system is needed for several reasons, such as: first, for individuals, cybersecurity means that their data will not be accessible to anyone except themselves or other people who have access. This is necessary to keep their computer devices working properly and free of malware; second, for small business owners, cyber security to ensure credit card data is protected correctly and consumer data security is protected; third, for online business owners, cyber security will protect their servers from unknown accesses from the outside; fourth, for shared service providers, cyber security will protect many of their data centers that house servers, and in turn accommodate many virtual servers that belong to different users or companies; and fifth, for the government, cyber security will build different data classifications that have their laws, policies, procedures, and technologies (Kaplan et al., 2015).

Citation Information: Yusup, D.K. (2022). Cyber security sharing platform: Indonesia approach in law enforcement of financial transaction crimes. *Journal of Legal, Ethical and Regulatory Issues, 25*(2), 1-22.

Then in terms of its objectives, the computer experts explained several purposes of using a cyber security system as a database consisting of several points: first, confidentiality, which refers to the term to ensure that information is not confidential, or freely available unauthorized entities (people, organizations, a computer process, etc.). Do not worry about confidentiality and privacy because confidentiality is a subset of privacy, which explicitly protects data from unauthorized entities. Privacy is a broader term for lag; second, integrity is accurate and complete data. Integrity also includes ensuring non-repudiation, which means that data created cannot be disputed for authenticity or accuracy. Cyber attacks that alter data will damage integrity; and third, availability, which ensures all information protected and the system used to store or process it can function adequately to achieve specific benchmarks. In this regard, people who are not very familiar with cybersecurity systems will consider availability as a secondary aspect, but ensuring availability is an integral part of cybersecurity, so maintaining availability is more complex than confidentiality or integrity (Boiko et al., 2019).

In the context of legal protection for consumers, providing personal data to companies even if the company already has a cyber security system that is considered very well does not seem to be safe from hacker attacks. Several risks need to be considered by companies when implementing a cybersecurity system (Mat et al., 2019), Such as: first, the risk of individuals potentially being misused, leaked, sold, or shared by unscrupulous users of the company's database to other parties in need; second, the financial risk of potential losses due to hacking. Direct economic losses can include the loss of money from an account by a hacker; of course, these financial losses will cause a loss of consumer confidence in companies whose security systems are weak; third, professional risk in the form of dismissal has the potential to be experienced by C-Level stakeholders because they are careless in maintaining the company's system security tools that are too easy to break into by a hacker; fourth, the business risk in the form of material loss has the potential to be experienced by the company because the cyber security system is too easy to break into by hackers, thereby reducing the level of trust of investors or business partners to the company; and fifth, personal risk in the form of confidential data belonging to someone, ranging from explicit photos and other activities that are very vulnerable to being broken into and misused, sometimes even having implications for a damaging personal relationship with other people.

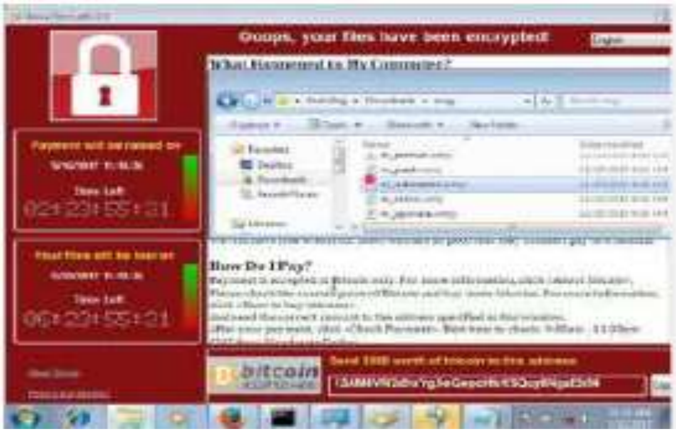
Besides that, there are several benefits of using a cybersecurity system both in terms of business and security (Cloud, 2020), Such as: first, it remains flexible. It must be remembered that cybersecurity is not a one-time thing and is then done. IT threats and business ecosystems must continue to evolve so that a cyber security strategy where everyone will follow suit; second, adopting best practices to meet needs. Many resources can help one build cybersecurity, including best practice guides and existing frameworks. However, he can immediately implement a standard cyber security strategy because it does not necessarily match the company. Therefore we must understand the requirements and infrastructure, then adapt accordingly; third, involve stakeholders. Building a program requires collaboration between IT and C-Level stakeholders. These stakeholders have a broad and clear understanding of the company's priorities and goals to provide additional ideas for building cybersecurity. The company leaders also need their sponsorship in the form of budget support and other resources to ensure cybersecurity is running correctly; and fourth, comprehensive: A comprehensive cybersecurity system strategy will cover many aspects such as data management, business process management, enterprise risk planning, user authorization, data sharing, and protection, including to prevention if the problems arise. Shortly, there are many benefits and uses of cyber security systems to protect all data, information, networks, and critical assets belonging to individuals, groups, or companies.

Cyber Security System Threats Types

Cyber security system is the process of protecting systems, data, networks, and programs from digital threats or attacks (Cisco, 2020). These attacks are generally carried out by irresponsible parties for various purposes. Some examples are accessing sensitive information, making content changes, or even changing and destroying important data. The motive may be to disrupt a business or it may be to extort large sums of money (Aliya, 2020). Most information technology experts consider cybersecurity the same as information security or commonly called InfoSec. Yet they are two different things. InfoSec is more understood as an important element of a cyber security system that has a specific function to handle data security, while cyber security system is more understood as a big umbrella of InfoSec and other elements. In this regards, internet observers in TechTarget explained a lot about the various threats that may be faced in cyber security systems (Shea et al., 2020), such as follows:

Malware

Malware is the first type of threat that most disrupts cyber security systems. This threat is usually in the form of malicious software that can annoy and harm computer users. Malware can harm system applications on computers and their users through the spread of computer viruses, spyware, worms, and many more (Idika & Mathur, 2007).



Ooops, your files have been encrypted!

What Happened to My Computer?

Payment will be raised on

Time Left

02:23:55:21

Your files will be lost on

Time Left

06:23:55:21

How Do I Pay?

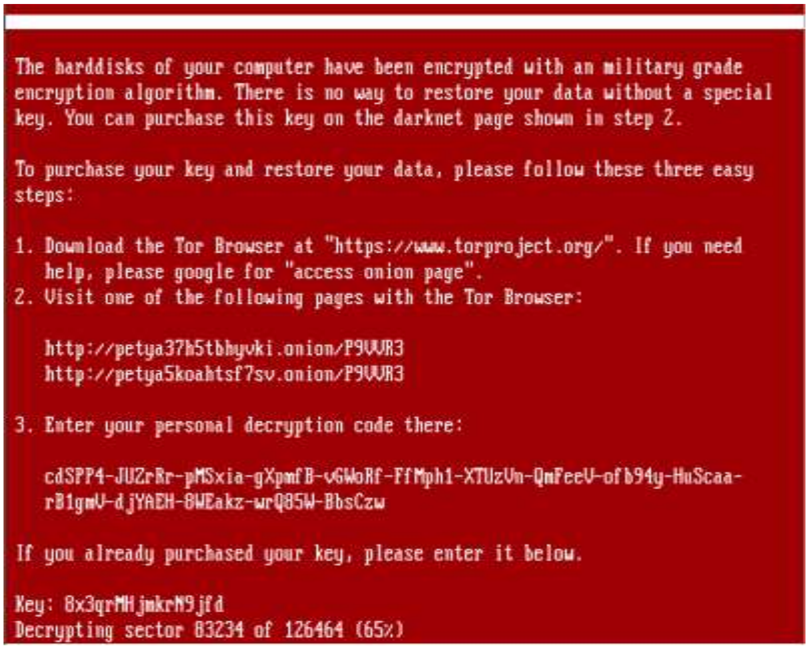
Send $300 worth of bitcoin to this address:

Source: www.kompas.co.id (2019)

FIGURE 1
MALWARE

Ransonware

Ransomware is the second type of threat that can interfere with cyber security systems. Ransomware is generally a form of malicious software, but it is more extreme than just spreading viruses (O'Gorman & McDonald, 2012). Hackers will usually block access to someone (the account owner) to open a computer or important document. The only way to get him back into the computer is to pay the ransom demanded by the hacker. Even so, paying this amount of money also does not ensure that the files or computer systems that were taken over can return to normal (Richardson & North, 2017).



```
The harddisks of your computer have been encrypted with an military grade
encryption algorithm. There is no way to restore your data without a special
key. You can purchase this key on the darknet page shown in step 2.

To purchase your key and restore your data, please follow these three easy
steps:

1. Download the Tor Browser at "https://www.torproject.org/". If you need
   help, please google for "access onion page".
2. Visit one of the following pages with the Tor Browser:

   http://petya37h5tbhyvki.onion/P9VVR3
   http://petya5koahtsf7sv.onion/P9VVR3

3. Enter your personal decryption code there:

   cdSPP4-JUZrRr-pMSxia-gXpmfB-vGWoRf-FfMph1-XTUzVn-QmFeeV-ofb94y-HuScaa-
   rB1gmV-djYAEH-8WEakz-wrQ85W-BbsCzw

If you already purchased your key, please enter it below.

Key: 8x3qrMHjmkrN9jfd
Decrypting sector 83234 of 126464 (65%)
```

Source: www.cnnindonesia.co.id (2020)

FIGURE 2
RANSONWARE

Social Engineering

Social Engineering is the third type of threat that can disrupt cyber security systems. This term is used to describe attacks based on human interaction. In computer sciences, social engineering is understood as an important branch of information security, which the discipline is not well defined, because there are a number of different definitions appear in the literature (Salahdine & Kaabouch, 2019). Social engineering is commonly used by hackers to manipulate user data by providing sensitive information, such as passwords, answers to security questions, and more. This type of threat usually takes advantage of human curiosity and provokes it to do things that may feel normal, but are actually dangerous (Aldawood & Skinner, 2018).

Citation Information: Yusup, D.K. (2022). Cyber security sharing platform: Indonesia approach in law enforcement of financial transaction crimes. *Journal of Legal, Ethical and Regulatory Issues, 25*(2), 1-22.

Source: www.tembolok.co.id (2020)

FIGURE 3
SOCIAL ENGINEERING

Phishing

Phishing is the fourth most common type of threat to disrupt cyber security systems. Phishing is a form of fraud that is usually present via email in the form of Spam, where a fraudster will send an email using an address that is similar to a trusted source. Even so, there are one or two different letters that are usually invisible to the naked eye. This scam aims to steal sensitive data such as credit card security numbers, passwords, and other important information (Baykara & Gürel, 2018). Shortly, if you get the desired email, the email sender will require someone to enter sensitive data. Therefore, every person who receives an email message in the form of spam, he must always ensure the credibility of the sender of the email (Buber et al., 2017).

Facebook helps you connect and share with the people in your life.

Source: www.kompasiana.com (2020)

FIGURE 4
PHISHING

Cyber Security Sharing Platform di Indonesia

Currently, the Indonesian government has owned and implemented a financial cyber security system in a Cyber Security Sharing Platform. This system was created to protect the financial sector payment system from various threats of cyberattacks. According to the Deputy Governor of Bank Indonesia (BI), Doni Primanto Joewono, who explained in an online discussion broadcasted on the Bank Indonesia YouTube Channel that the cyber security sharing platform is used as a means to share information about cyber threats and cyber incident mitigation, between organizations and institutions that are included in the financial ecosystem and payment system in Indonesia (Joewono, 2021). For example, he explained that Bank Indonesia currently has a Cyber Security Sharing Platform, and Bank Indonesia has asked every financial institution for all payment systems to share information.

Every bank that detects a cyber threat or experiences a cyber incident must report it via email at CSPP-SP@bi.gp.id. Each incoming report will be analyzed and shared with other organizations via the Cyber Security Sharing Platform as material to improve cyber security and prevent attacks. This platform is processed by Bank Indonesia itself, which includes filtering, formatting, and any attack analysis shared by other banks. In addition, any information provided by the organization through sharing platforms, especially those that are vulnerabilities, threats, incidents, and others, are equipped with sharing traffic protocol rules. This rule regulates all information shared with the public, among related organizations, between the Bank of Indonesia and the sender of information only, or between CSSP members only. The main hope to be achieved from using this cyber security sharing platform is that every organization that is included in the digital economy ecosystem can improve its cyber security (Ulya & Jatmiko, 2021).

Furthermore, in recent years, fintech has continued to increase in Indonesia. The pattern of financial transactions relies not only on conventional designs but is now increasingly shifting to fintech. The increasing connection between banks and fintech in financial transactions will undoubtedly be very vulnerable to cyber threats. Based on data held by Bank Indonesia, recently, there has been a significant increase in cyber attacks on the financial sector, reaching almost 70 percent. The consequence of this integration and collaboration between banks and fintech is that sensitive and responsive policies and actions are needed to ward off these cyber attacks. Therefore, Bank Indonesia as the regulator of the banking system in Indonesia is very concerned about strengthening the cyber security sharing platform to build a secure digital financial ecosystem (Suud & Sandy, 2021).

In addition, although in general, the financial industry players have governance and capabilities in cyber risk management, it is still necessary to strengthen standard certification, adequacy of human resource capabilities, fraud risk management, the role of third parties, and the establishment of a cyber security operation center for the financial sector. To support this security, Bank Indonesia also cooperates with the National Cyber Encryption Agency (BSSN) and related industries to synergize together in developing security in the financial transaction system in Indonesia.

Constraints of Cyber Security Sharing Platform in Indonesia

Among the most decisive problems faced by Indonesia in implementing the cyber security sharing platform is the shortage of talented personnel who have expertise in the field of cyber security systems. This raises genuine problems in the strategic industry, defense, national unity, and business. An illustration describes the possibility that if Indonesia faces a cyberwar, the number and tactical capabilities of the Cyber Army in Indonesia may still be minimal to be able to defend and strengthen the nation's defense system (Yunita, 2020).

In this regard, the Indonesian government must increase the strength and capabilities of human resources in proportion to the progress and strength of technology itself. Moreover, it is a vital need in the industrial world, such as banking, telecommunications, and government agencies. All countries in the world today have used information technology as a basis of strength and, at the same time, economic progress. It should be realized that information technology will continue to increase every year in the future without limits. In various kinds of information technology problems, the element of human resources plays a significant role. Therefore, every country needs to prepare to prevent various inequalities that may arise due to the rapid development and advancement of information technology.

Referring to the results of previous surveys, Eva Noor, CEO of PT Xynexis International, explained that the world currently needs at least 15 million experts for cyber security systems. Indonesia now needs around 1000 cyber security experts outside of officers for various needs of government agencies, industry, banking, telecommunications, etc. To address and overcome this, it is necessary to make a breakthrough so that there is no gap between the advancement of information technology and human resources or special supervisory personnel in the IT field. PT Xynexis gave birth to innovation with the idea of the Born to Control program in collaboration with The Indonesian Ministry of Communication, Information and Telecommunications (Kominfo) in applying and running the agenda for the wider community (Noor, 2017).

For example, in the last three years, PT. Xynexis has partnered with Kominfo to search for talent among young people interested in the Born to Control program. It is possible, in the future, to collaborate with various government agencies in Indonesia, such as the Ministry of Defense, Ministry of Maritime Affairs, Ministry of Nasional Education, Bank Indonesia, Financial Institutions, and other government-owned agencies, including private parties such as automotive, telecommunications, banking, insurance, and industry players who are seen to be able to partner in this program.

Born to control is a cyber security talent search program in Indonesia, intending to attract a minimum of 2000 human resource talents in cyber security systems for 2017 in information technology today. In addition, the need for cyber security system supervisors is also still needed to provide supervision and guidance to cyber security system operators. This program ideally has a junior or senior secondary education background to higher education with qualifications and competencies in the IT field, especially a Bachelor of Information Technology where informatics engineering is the main subject at the university (Yovita, 2017).

In the talent search process, PT. Xynexis, together with Kominfo in 2017, carried out awareness-raising in five cities in disseminating the program that was initiated with the hope that it would continue in other cities in the following year. Awareness referred to here aims to invite all levels of society, especially the younger generation, interested in cyber security programs. Especially for the talent search program in this cyber security system, you don't have to understand IT because just having an interest is enough, which will then be gathered and given special training at the boot camp, which will be held for two weeks in the second stage in recruiting candidates. From the 2000 participants, it is hoped that the 100 best people in each region will be selected and given character building and special training with international standards. The coaching aims to create good personnel with their IT skills and to produce a good mindset from a candidate who is elected in the future. This character building is essential because many people are smart and have excellent IT skills, but many people find these skills used in things that are not good or negative. In other words, building the mindset of human resources in the IT field can at least defend themselves while also being a retainer and defender of the state in the face of various cyber-attacks or other severe threats in the future.

In the talent search program, the targeted targets for the Born to Control recruitment process are all Indonesian citizens, aged 16 years and over, and those with high school education up to college. Everything starts from the initial/basic, intermediate, and advanced test processes. Although the candidates who participate have a high school educational background and do not continue to college, they are considered very talented and motivated. Of course, there is a very high possibility that they will be selected and selected as the leading candidate. Those settings will be re-selected to be the best candidates and will receive appreciation in the form of educational scholarships. In addition, they will also be given access and the opportunity to work for various companies or agencies in need.

The limited human resources and skills in Indonesia are still the most demanding challenges with a share of 36%, surpassing limited investment funding (31%), low access to a robust technology ecosystem (20%), government policies or regulations (17%), and security issues cyber (15%). Of course, In terms of its benefits, the Born to Control Program is very important to continue to be held so that there is no imbalance between advances in information technology and the availability of human resources. This program will also provide many benefits for the government to no more extended import or bring in experts from abroad to handle various cyber security system problems in Indonesia. If the policy is not the populist way, it will be very detrimental and endanger the defense and security of the country (Abdillah, 2019).

This is a dilemma that arises in Indonesia today, where on the one hand, Indonesia needs the development of information technology in the field of business industry and governance. However, on the other hand, its human resources are still minimal. In short, the Cyber Security Sharing Platform with all its derivative programs can be said as a substantial effort by the Indonesian government to no longer depending on foreign experts, but to prioritize the development of the quality of domestic resources with the general aim of maintaining the confidentiality of data, information, sovereignty, defense, and national security. An essential thing from the government's efforts is to build and grow the mindset of cyber security system retainers in Indonesia to take part in counteracting all forms of attacks (cyberwars) that may occur at any time.

Strategy and Policy on Cyber Security Sharing Platform in Indonesia

As explained at the beginning of this paper, Indonesia is the country with the highest digital economic transaction value in the ASEAN region, reaching US$ 44 billion, and is predicted to continue to rise in 2025 to reach US$ 124 billion. With the largest population and internet users in the ASEAN region, Indonesia is committed to increasing economic recovery efforts from the impact of the COVID-19 pandemic and promoting long-term economic growth through digitalization support and a more sustainable approach. This was raised at the 7th Annual Meeting of the Ministers of Finance and Governors of the ASEAN Central Banks, held virtually on March 30, 2021.

According to Haryono, Head of the Communications Department of Bank Indonesia explained that as a form of Indonesia's commitment to strengthening future economic resilience, the Indonesian government has agreed on several commitments to enhance support for the digitalization of the national economic and financial system together with other ASEAN countries (Haryono, 2021), such as follows:

1. Welcoming the various policy steps that have been implemented quickly and on a large scale by ASEAN member countries, including fiscal and monetary policies, to restore the economy and maintain financial stability from the impact of the Covid-19 pandemic;
2. Completing the transition work plan from the ASEAN Framework Agreement on Services (AFAS) to the ASEAN Trade in Services Agreement (ATISA) ensures a commitment to open market access in the financial services sector that is more substantive and meaningful in the 9th AFAS Protocol. The 9th AFAS protocol is the last protocol before the transition to ATISA and is planned for co-signing;
3. Preparing the strategic steps towards banking integration in the ASEAN region in the digital era through the refinement of the ASEAN Banking Integration Framework (ABIF) Guidelines;
4. Continuing the commitment to facilitate the flow of capital traffic in the ASEAN region through the gradual elimination of restrictions, monitoring, and regular policy discussions, as well as increasing the capacity of human resources;
5. Promoting the linkage of payment systems in the ASEAN region to facilitate trade, business, and financial inclusion;
6. Developing the ASEAN Taxonomy for Sustainable Finance, which will be a guide and common language for all member countries in developing an environment-based financial and financing system;
7. Supporting the ASEAN Sustainable Banking Principles initiative, which will serve as a guide for central banks in ASEAN in developing environmentally-based banking practices that are following the conditions in each country;
8. Continuing the efforts to create financial inclusion in ASEAN, including through monitoring and evaluation activities as well as developing guidelines on digital financial literacy policies;
9. Appreciating and supporting the operation of the ASEAN Cybersecurity Resilience and Information Sharing Platform (CRISP) as a means of exchanging information among ASEAN central banks in dealing with cybersecurity threats and developing joint mitigation measures.

The primary role of the Indonesian government in strengthening digital-based financial transaction policies also received appreciation and support from several international institutions that were present at the meeting, including Asian Development Bank (ADB), Asian Infrastructure Investment Bank (AIIB), ASEAN+3 Macroeconomic Research Office (AMRO), the World Bank (WB), and the International Monetary Fund (IMF), as well as from several business organizations, namely the ASEAN Business Advisory Council, the EU-ASEAN Business Council, and the US-ASEAN Business Council.

During its development, the Indonesian government took several concrete steps related to strengthening regulations in cyber security systems. For example, the legal basis for regulating the cybersecurity system in Indonesia is the Electronic Information and Transactions Law Number 11 of 2008, and its revised with Law Number 19of 2016 (EIT Law). The EIT Law covers several offenses, such as distributing illegal content, breach of data protection, unauthorized access to another computer system to gain information, and any unauthorized and unlawful interception or wiretapping of other computer systems or electronic systems. The EIT Law provides legal protection for the content of electronic systems and electronic transactions. However, the EIT Law does not cover essential aspects of cybersecurity, such as information and network infrastructure and human resources with expertise in cybersecurity (Anjani, 2020).

Based on the EIT Law from 2016, the government of Indonesia issued technical regulations in Government Regulation Number 71 of 2019 on the Implementation of Electronic Systems and Transactions (GR 71 of 2019). This regulation contains updates related to the implementation of cybersecurity in electronic systems and transactions. Apart from several articles about the offenses regulated by the EIT Law, It also contains stronger provisions regarding protecting personal data and information and website authentication to avoid fake, fraudulent, or scam websites. Besides that, it also emphasizes the need for the government to prevent any harm to public interests through the misuse of electronic information and electronic transactions and the need to develop a national cybersecurity strategy. However, it covers only cybercrimes related to electronic commerce, such as the misuse of data, unauthorized electronic signatures, and the spread of malicious viruses and codes. The EIT Law and GR 71 of 2019's limited coverage provide an inadequate response to ever-changing cyber threats, particularly to the government's critical infrastructure.

The Ministry of Defence Regulation Number 82 of 2014 provides cyber defense guidelines to deal with cyber threats to national security. It is the only regulation that defines cybersecurity: National cybersecurity comprises all efforts to secure the information and the supporting infrastructure at the national level from cyberattacks. Any words or actions done by any party that threatens national security, national sovereignty, and territorial integrity are considered cyberattacks. Unlike the EIT Law, the regulation covers critical infrastructure of, for example, the financial and transportation systems as objects of cybersecurity. However, the code only develops military cyber defense capacities, developed and implemented by the Ministry of Defence for the National Armed Forces. For non-military cyber threats, it refers to other regulations, such as the EIT Law.

Furthermore, in subsequent developments, especially after discussions of the Bill were initiated in May 2019, the academic research for the Bill was uploaded for public viewing by the DPR in June 20195. While the academic paper was made available to the public, the Cybersecurity Bill was never uploaded to the internet. This led to an online petition6 criticizing the closed policy-making process. The petition called for postponing the Cybersecurity Bill and requested involving the private sector and the academia in the deliberations. Thus, the Bill had also not involved relevant government institutions, such as MOCI and National Development Planning Agency (Aprilianti & Dina, 2021).

The closed policy-making process and the exclusion of the private sector resulted in articles that potentially hindered innovation and the development of cybersecurity services and products. Reports of the Bill stipulated certification requirements for businesses that plan to develop cybersecurity services and products for the government procurement process. However, these requirements might have duplicated requirements already stated in other laws and regulations. Article 17 of the Bill required businesses to get BSSN certifications for the products they want to offer for cybersecurity. Articles 19 and 21 required human cybersecurity resources to meet BSSN standards and acquire certifications from organizations accredited by BSSN. It remained unclear whether these certifications were the same as those stipulated by the ITE Law under the mandate of MOCI. If they had not been identical, the Bill would have added compliance costs for the private sector and created redundancies of these certifications. This would have disproportionately affected small and medium-sized enterprises with less institutional compliance capacities (Anjani, 2020).

Smaller companies will also be affected by BSSN Regulation Number 8 of 2020 on Security Systems in the Implementation of Electronic Systems, issued in December 2020. It is a technical regulation requested by Article 24 of GR 71 of 2019. BSSN Regulation Number 8 of 2020 lays out the need for electronic systems (public and private) operators to ensure the safety of their information management. The regulations require electronic system operators to employ an individual security expert (local or foreign) or a consulting agency to oversee the implementation of their electronic systems. However, there is no explanation of what qualifications these experts or agencies need according to BSSN standards. The draft of the Cybersecurity Bill followed the exact requirement and did not elaborate on the required expertise.

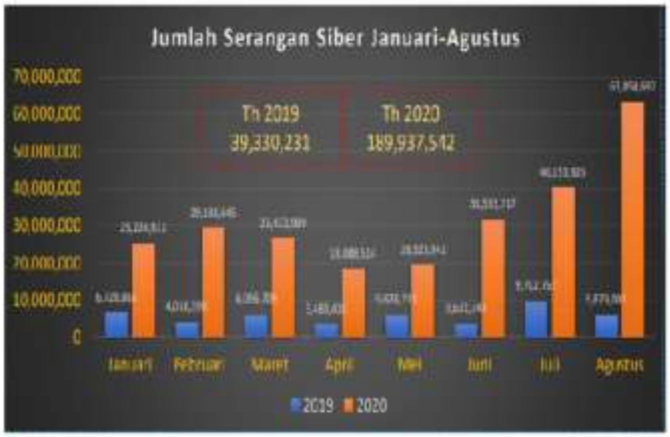
Besides those product certifications, Article 48 of the Cybersecurity Bill mandated BSSN to issue permits for conducting research on or testing cybersecurity applications. This added further confusion as the article did not determine which activities in research or testing of cybersecurity require a permit from BSSN. Thus, article 66 of the Cybersecurity Bill required businesses to meet local content requirements, precisely a domestic component level (TKDN) of 50%. Since most companies use foreign hardware and software in their products and services, the required 50% TKDN would have affected Indonesia's development of cybersecurity products and services. All mentioned articles appeared to contradict the aim of increasing cyber competitiveness and innovation through cyber utilization that is free, open, and responsible, as stated in Article 3 (b) of the Cybersecurity Bill. This aim can only be achieved in a meaningful dialogue with all relevant stakeholders from the corporate sector, academia, and the civil society (Anjani, 2020).

Referring to the description above, transparency is one of the principles established by Law Number 12 of 2011 on the Formulation of Law and Regulations in Indonesia. It is manifested by disseminating the draft law to inform the public and get input from the crowd and relevant stakeholders. Besides, the public has the right to provide feedback orally and in writing in the legislative process. The law also lays out several ways to give feedback, including public hearing meetings, work visits, socialization, seminars, workshops, and discussions. The closed policy-making process of the Cybersecurity Bill was criticized for not complying with this law.

Law Enforcement on Financial Transaction Crimes in Indonesia

The investigators from the Criminal Investigation Unit of the Indonesian National Police noted that the number of financial transaction crimes caused by cyber security attacks was still relatively high. During the 2019-2020 periods, it reached 159,937,542 cases. This number experienced a very significant increase when compared to 2019, which got 39,330,231 points. Until now, the police of the Republic of Indonesia are still investigating various cyber crimes, which generally occur in the form of breaking into customer accounts at several large banks in Indonesia by using internet banking software. The main perpetrators are usually carried out by national and international syndicates who are very familiar with the cyber security system in Indonesia so that they use the crime mode of breaking into bank customer accounts which results in financial losses (Djumena, 2020).

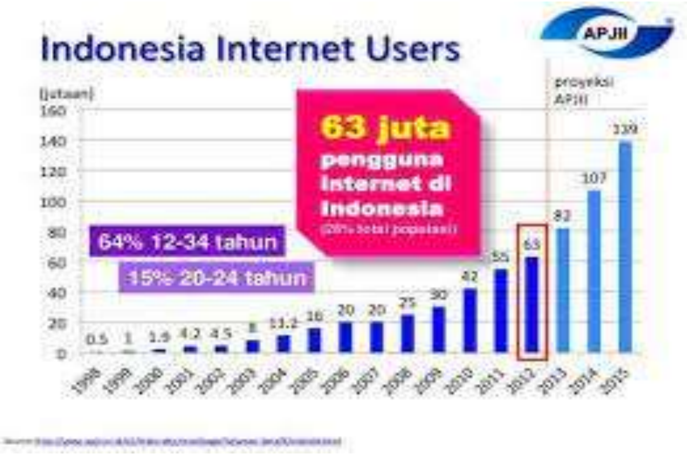
Based on the results of the analysis and findings of investigators at the Indonesian National Police Criminal and Investigation Agency, it is known that the perpetrators of criminal acts of digital-based financial transactions are generally international syndicates that use several modes as follows: first, the case began when the perpetrator offered an antivirus application device through a service message. on the internet to victims of e-banking users to download them; second, the perpetrator then uses malware to manipulate the menu display and steal bank customer data that is implanted through the internet network; third, the perpetrator hijacks the internet banking account of the bank customer so that when the customer is about to deposit money into his statement, the flow of funds will be diverted to the perpetrator's account; fourth, the perpetrator can easily control the customer's e-banking account after knowing the victim's password; and fifth, the perpetrators are generally not Indonesian citizens, but instead use the courier service of a Non-Indonesian Citizen, then the perpetrator of the Non-Indonesian Citizen transfers the stolen money back to the account of the perpetrator who was recruited from among Indonesian Citizens (Simanjuntak, 2020).



Source: www.technokompas.co.id (2020)

FIGURE 5
CYBER ATTACKS IN INDONESIA

Indonesia is recognized as one of the countries with the most significant number of internet users globally and will become an easy target for digital-based (online) crimes, especially many people who still use fake software, so they are very vulnerable to being hacked by hackers. According to Irwan Lubis, Deputy Commissioner for Banking Supervision of the Financial Services Authority (OJK), he admitted that his party had not received reports from the bank, the Criminal Investigation Unit of the Indonesian National Police, and other institutions regarding the cases of burglary customer funds at several banks in Indonesia. He also emphasized that OJK had asked all banks in Indonesia to increase the level of cyber security system security in all forms of digital-based bank services. The reason is the high number of crimes against cyber security systems in financial institutions generally seems to be directly proportional to the number of internet users in Indonesia, which reaches 63 million users (Lubis, 2021).



Source: www.researchgate.com (2020)

FIGURE 6
INTERNET USSERS IN INDONESIA

From 2019 to the present, the Indonesian National Cyber and Crypto Agency reported 290 million cases of cyberattacks. That was 25% more than the previous year when cybercrimes had caused losses of USD 34.2 billion for Indonesia. The Covid-19 pandemic in 2020 triggered a significant increase in phishing attacks, mail spams, and ransomware attacks, adding to the urgency of establishing a well-functioning infrastructure for cybersecurity in Indonesia. Therefore, Indonesian cyber security laws and regulations have to create fragmented responsibilities across different ministries. They remain ineffective in preventing cyberthreats and cybercrime through comprehensive regulation and law enforcement efforts. In this regard, there are at least several institutions that are directly related to law enforcement efforts in eradicating criminal acts of digital-based financial transactions in Indonesia, including Bank Indonesia, Financial Services Authority, Police, Attorney General's Office, Supreme Court, Ministry of Communication and Information, Ministry of Finance, Ministry of Defense, the State Intelligence Agency, and the National Cyber Encryption Agency (Ramli & Movanita, 2020).

The first example of law enforcement for money laundering cases is the Kuala Simpang District Court Decision Number: 212/Pid.Sus/2020/PN.Ksp dated January 28, 2021. This case begins with a report based on an analysis or examination of news and information on Financial Transactions containing indications of criminal acts of money laundering and other criminal acts as referred to in Article 2 paragraph (1) page 144 of 219 in the Court Decision Number: 212/Pid.Sus/2020/PN.Ksp is strengthened by statements from PPATK officials who have provided assistance law, including providing expert information, especially in the field of prevention and eradication of money laundering crimes for examination. The main points of the case that were proven in the trial showed that there was a criminal element of money laundering to hide or disguise the origin of assets. Following the opinion of Expert Hardi Setiyo, SH from the Center for Financial Transaction Reports and Analysis (PPATK) gave the thought that in the perspective of money laundering, the act of a criminal act of borrowing or using another person's account to accommodate, place, or transfer the assets resulting from the crime. Crime is seen as an attempt to hide or disguise the origin of wealth.

In consideration, the Panel of Judges refers to Article 39 of Law Number 8 of 2010 on Prevention of the Eradication of the Crime of Money Laundering. Article 40 of this law provides firm and unmistakable evidence. Finally, the panel of judges had decided that Defendant (Kamal alias Kmel) was declared legally and convincingly guilty of committing the crime of money laundering. The Perpetrator was also given a prison sentence of 7 (seven) years and a fine of IDR 1.000.000.000, (One billion rupiah) with the provision that if the fine is not paid, it will be replaced with imprisonment for 6 (six) months. In addition, all assets obtained from the proceeds of money laundering are confiscated into the property of the State (ISC, 2020).

The second example is committing a false recording in financial statements as shown in the South Jakarta District Court Decision Number: 322/Pid.Sus/2019/PN JKT.SEL dated July 24, 2019. This case began when Defendant (Mamnuah) had made a false record by asking an employee of Bank Mandiri Micro Unit Mandiri Bintaro, South Jakarta, who has a password, namely witness Santi Arini, S.E., as a Credit Analyst to change the due date of credit installments for borrowers in the financial recording system, so that the installments of debtors in the Mandiri Micro Portfolio look smooth and sound, even though the loan installments managed by the defendant were in default.

In the consideration, the panel of judges succeeded in finding the facts revealed in the trial that the defendant was proven knowingly and intentionally to have made or caused false records in the books of the reporting process and documents or reports on business activities, as stated on page 46 of 55 in the Court Decision Number: 322/Pid.Sus/2019/PN JKT.SEL has fully complied with all elements of the crime of financial transaction crime as regulated in Article 49 paragraph (1) letter (a) of Law Number 8 of 2010 concerning Prevention and Eradication of the Crime of Laundering Money. Finally, the panel of judges decided that the Defendant (Mamnuah) was declared legally and convincingly guilty of committing a criminal act. The bank employee (Santi Arini, S.E.) was found guilty of intentionally making or causing false records in the books of the reporting process and documents or business activity reports, transaction reports or bank accounts, and money laundering. Finally, both were given a prison sentence of 5 (five) years and a fine of IDR 10.000.000.000- (ten billion rupiah) with the provision that if the fine was not paid, it was replaced with imprisonment for 2 (two) months. In addition, the panel of judges also stipulates that the period of arrest and detention that the Defendant has served is deducted entirely from the sentence imposed with a clause stipulating that the Defendant remains in custody and defines all the evidence mentioned in the verdict (ISC, 2019).

The two examples of court decisions above have at least provided a concrete picture that the Indonesian government has carried out earnest law enforcement efforts in eradicating every criminal act of financial transaction crime, whose primary purpose is as an effort to preventive effect and at the same time provide a deterrent effect for each Perpetrator. Shortly, the strategies and policies of the Indonesian government through strengthening regulations, law enforcement, and implementing the Born to Control Program through the implementation of the Cyber Security Sharing Platform have proven positive implications in dealing with various cyber-based threats and attacks.

CONCLUSION

At the end of this paper, the following conclusions can be formulated: first, with all its advantages and disadvantages, cyber security systems are an absolute necessity that must be owned by the State and companies to protect data and various essential informations in order to avoid all forms of digital-based attacks (cyber); second, several threats that may be faced in the cyber security system, namely malware, Ransonware, social engineering, and phishing; third, Indonesia already has a cyber security sharing platform that is used to share information about cyber threats and cyber incident mitigation, between organizations and institutions that are included in the financial ecosystem and payment system; fourth, the most decisive problem faced by the Indonesian government in implementing the Cyber Security Sharing Platform is the shortage of talented personnel who have expertise in the field of cyber security systems; fifth, strengthening regulations, law enforcement, and implementing the Born To Control Program is a strategy and concrete policy of the Indonesian government in overcoming any potential criminal acts of digital-based financial transactions and at the same time providing the need for skilled human resources in managing the Cyber Security Sharing Platform; Sixth, there are several institutions that are directly related to law enforcement efforts in eradicating criminal acts of digital-based financial transactions in Indonesia, including: Bank of Indonesia, Financial Services Authority, Police, Attorney General's Office, Supreme Court, Ministry of Communication and Information, Ministry of Finance, Ministry of Defense, the State Intelligence Agency, and the National Cyber Encryption Agency; and seventh, the main objective of law enforcement is to preventive effect and provide a deterrence effect to every Perpetrator of criminal acts of financial transaction crimes in Indonesia.

.

ACKNOWLEDGMENT

This paper is the result of competitive research that has been systematically and comprehensively compiled following academic norms and a rule, free from conflict of interest, and has been presented at the national workshop on law enforcement preventing criminal acts of financial transactions at UIN Sunan Gunung Djati Bandung, West Java, Indonesia, on 10 July 2021.

REFERENCES

Abdillah, A. F. (2019). *The challenges of running cyber security in Indonesia*. Retrieved from https://www.indotelko.com/read/1561689578/cybersecurity-di-indonesia

Adiwijaya, S. (2020). *BI encourages digitalization of Islamic economy and finance.* Retrieved from https://www.tagar.id/bi-dorong-digitalisasi-ekonomi-dan-keuangan-syariah

Akbar, D. L. (2019). Criminal law policy in handling digital asset-based money laundering in Indonesia. *Journal of Law and Legal Reform*, 1(1), 129-176.

Aldawood, H., & Skinner, G. (2018). Educating and raising awareness on cyber security social engineering: A literature review. In *2018 IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE)* (pp. 62-68).

Aliya, H. (2020). *Completely peel cyber security and the ins and outs.* Retrived from https://glints.com/id/lowongan/cybersecurity-adalah/#.YN1v_aoxXIU)

Anjani, N.H. (2020). *Policy brief: Cybersecurity protection in Indonesia*. Retrieved from https://www.cips-indonesia.org/post/policy-brief-cybersecurity-protection-in-indonesia

Aprilianti, I., & Dina, S. (2021). Co-regulating the Indonesian digital economy. *Center for Indonesian Policy Studies*. Retrieved from https://repository.cips-indonesia.org/publications/332998/co-regulating-the-indonesian-digital-economy

Atikah, I. (2020). Consumer protection and fintech companies in Indonesia: Innovations and challenges of the financial services authority. *Jurnal Hukum dan Peradilan*, *9*(1), 132-153.

Baldassarre, M. T., Santa Barletta, V., Caivano, D., Raguseo, D., & Scalera, M. (2019). Teaching cyber security: The hack-space integrated model. In *ITASEC*.

Baykara, M., & Gürel, Z. Z. (2018, March). Detection of phishing attacks. In *2018 6th International Symposium on Digital Forensic and Security (ISDFS)* (pp. 1-5).

Benzie, J., McCarter, D., & Ko, R. (2014). Cyber security NZ SME landscape: Report prepared for vodafone NZ Ltd.

Boiko, A., Shendryk, V., & Boiko, O. (2019). Information systems for supply chain management: Uncertainties, risks and cyber security. *Procedia computer science*, *149*(2), 65-70.

Buber, E., Dırı, B., & Sahingoz, O. K. (2017, October). Detecting phishing attacks from URL by using NLP techniques. In *2017 International conference on computer science and Engineering (UBMK)* (pp. 337-342).

Cisco, (2020). *What is cyber security system.* Retrieved from https://www.cisco.com/c/ en/us/ products/security/what-is-cybersecurity.html

Cloud, I. (2020). *How cyber security helps your business grow.* Retrived from https://indonesiancloud.com/bagaimana-cybersecurity-membantu-pertumbuhan-bisnis-anda/

Craigen, D., Diakun-Thibault, N., & Purse, R. (2014). Defining cyber security. *Technology Innovation Management Review*, *4*(10), 1-9.

Djumena, E. (2020). *The mode of breaking into customer accounts through e-banking.* Retrieved from https://money.kompas.com/read/2015/04/15/113500326/Ini.modus.pembobolan.rekening.nasabah.melalui.e-banking.?page=all

Girsang, H. (2014). Eradication of the crime of trafficking in persons through the law on the prevention and eradication of the crime of money laundering. *Journal Ilmu Hukum Jambi*, *5*(1), 432-487.

Harahap, H. H. (2020). Prevention and eradication of the crime of money laundering. *Amaliah: Jurnal Pengabdian Kepada Masyarakat*, *4*(2), 186-190.

Haryono, E. (2021). *Press release: Indonesia commitment to ASEAN economic recovery, digitization and sustainability.* Retrieved from https://www.bi.go.id/id/publikasi/ruang-media/news-release/Pages/sp_238221.aspx

Hidayat, A. (2020). New regulation on payment system no. 22/23/PBI/2020 by central bank of Indonesia. *eCo-Buss*, *3*(1), 1-6.

Husein, Y. (2003). Money laundering in international law perspective. *Indonesian Journal of International Law*, *1*(1), 342.

Idika, N., & Mathur, A. P. (2007). A survey of malware detection techniques. *Purdue University*, *48*(2), 1-9.

Joewono, D. P. (2021). Leaders insight (Interlink Bank and Fintech): Utilization of digital ID, cyber security. *Presented paper in online discussion, which was broadcast on the Bank Indonesia YouTube Channel, Thursday (April 8, 2021).*

Kaplan, J. M., Bailey, T., O'Halloran, D., Marcus, A., & Rezek, C. (2015). *Beyond cyber security: Protecting your digital business*. John Wiley & Sons.

Kouttis, S. (2016). Improving security knowledge, skills and safety. *Computer Fraud & Security*, *16*(4), 12-14.

Kurniawan, I. (2012). The development of the crime of money laundering and its impact on the economy and business sector. *Jurnal Ilmu Hukum*, *4*(1), 1-9.

Lubis, I. (2020). *The mode of breaking into customer accounts through e-banking.* Retrieved from https://money.kompas.com/read/2015/04/15/113500326/Ini.Modus.pembobolan.rekening.nasabah.melalui.e-banking.?page=all

Mat, B., Pero, S., Wahid, R., & Sule, B. (2019). Cybersecurity and digital economy in Malaysia: Trusted law for customer and enterprise protection. *International Journal of Innovative Technology and Exploring Engineering.*

McIntosh, C. (2015). Cyber-security: Who will provide protection? *Computer Fraud & Security*, *15*(12), 19-20.

Noor, E. (2020). *Indonesia lacks cyber security talent.* Retrieved from https://kominfo. go.id/content/detail/8574/indonesia-kekurangan-bakat-cyber-security/0/sorotan_media

Nugroho, N., Sunarmi, S., Siregar, M., & Munthe, R. (2020). Analysis of the prevention of money laundering by bank negara Indonesia. *ARBITER: Jurnal Ilmiah Magister Hukum*, *2*(1), 100-110.

Nuryanto, A. D. (2019). The problem of investigating the crime of money laundering originating from the banking predicate crime. *Bestuur*, *7*(1), 54-65.

O'Gorman, G., & McDonald, G. (2012). *Ransomware: A growing menace*. Arizona, AZ, USA: Symantec Corporation.

Pangestu, M., & Dewi, G. (2017). Indonesia and the digital economy: Creative destruction, opportunities and challenges. In *Digital Indonesia* (pp. 227-255). ISEAS Publishing.

Prawirasasra, K. P. (2018). Financial technology in Indonesia: Disruptive or collaborative. *Reports on Economics and Finance*, *4*(2), 83-90.

Rahman, R. (2020). *Jokowi calls on fintechs to adopt good governance for enhanced cybersecurity, services.* Retrieved from https://www.thejakartapost.com/news/2020/ 11/15/jokowi-calls-on-fintechs-to-adopt-good-governance-for-enhanced-cybersecurity-services.html

Ramli, R. R., & Movanita, A. N. K. (2021). *How bank Indonesia faces cyber crime in the national economic and financial ecosystem.* Retrieved from https://money.kompas. com/read/2021/04/09/065726826/cara-bi-hadapi-kejahatan-siber-di-eksosistem-ekonomi-dan-keuangan-nasional

Rasyida, A. J. (2020). Case study of financial services authority: The role of digital financial innovation in supporting financial inclusion in Indonesia an internship report.

Richardson, R., & North, M. M. (2017). Ransomware: Evolution, mitigation and prevention. *International Management Review*, *13*(1), 10-27.

Salahdine, F., & Kaabouch, N. (2019). Social engineering attacks: A survey. *Future Internet*, *11*(4), 89-94.

Shafqat, N., & Masood, A. (2016). Comparative analysis of various national cyber security strategies. *International Journal of Computer Science and Information Security*, *14*(1), 129-138.

Shea, S., Gillis, A.S., & Clark, C. (2020). *Cyber security system.* Retrieved from https:// searchsecurity.techtarget.com/definition/cybersecurity

Simanjuntak, V. (2020). *The mode of breaking into customer accounts through e-banking.* Retrieved from https://money.kompas.com/read/2015/04/15/113500326/Ini.modus.pembobolan.rekening.nasabah.melalui.e-banking.?page=all

Sitanggang & Winarto. (2020). *Digital transaction increase, supervision is more important*. Retrieved from https://keuangan.kontan.co.id/news/transaksi-digital-meningkat-peran-pengawasan-makin-penting

Stevens, T. (2016). *Cyber security and the politics of time*. Cambridge University Press.

Suud, Y. A., & Sandy, O. P. (2021). *Bank Indonesia says it already has a cyber security sharing platform*. Retrieved from https://cyberthreat.id/read/11174/BI-Bilang-Sudah-Punya-Cyber-Security-Sharing-Platform

Suwiknyo, E. (2021). *Top! The perpetrators of economic and financial crimes will be impoverished*. Retrieved from https://kabar24.bisnis.com/read/20210114/16/1342952/top-pelaku-kejahatan-ekonomi-dan-keuangan-bakal-dimiskinkan

Ulya, F. N., & Jatmiko, B.P. (2021). *6 steps by bi to overcome fraud in the financial sector*. Retrieved from https://money.kompas.com/read/2021/02/04/163000226/ini-6-langkah-bi-atasi-fraud-di-sektor-keuangan

Vishnum, (2020). *Cybersecurity threats cause US$34.2 Billion in economic losses to organizations in Indonesia*. Retrieved from https://news.microsoft.com/id-id/2018/ 05/24/ancaman-keamanan-siber-menyebabkan-kerugian-ekonomi-bagi-organisasi-di-indonesia-sebesar-us34-2-miliar/

Von Solms, R., & Van Niekerk, J. (2013). From information security to cyber security. *Computers & Security*, *38*(1), 97-102.

Yovita. (2017). *It takes 1.5 Million cyber soldiers to secure Indonesia.* Retrieved from https://kominfo.go.id/content/detail/9098/butuh-15-juta-tentara-siber-amankan-indonesia/0/sorotan_media

Yunita, (2017). *Indonesia lacks cyber security talent*. Retrieved from https://kominfo. go.id/content/detail/8574/indonesia-kekurangan-bakat-cyber-security/0/sorotan_ media)

Ziccardi, G. (2020). Wearable technologies and smart clothes in the fashion business: Some issues concerning cybersecurity and data protection. *Laws*, *9*(2), 1-12.