LEGAL ISSUES OF SMART CONTRACTS IN BLOCKCHAIN TECHNOLOGY

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Choose an item.

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DEDICATION

This thesis is dedicated to my family especially my father, who taught me that the best kind of knowledge to have been that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time. Last but not lease, my friends who always support, courage and motivate me to finish my thesis.

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ABSTRACT

Technologies are advancing along with the industrial revolution, and the growth of the blockchain technology market has increased globally and received attention and interest from society. The new form of digital currency has now become a pillar in daily life. All online platforms are now executing transactions in smart contract programs. The smart contract is created through blockchain technology to enhance the traditional contract with the characteristic of decentralized, encrypted, transparent, speedy, less cost and user controlled. However, not all applications are free from challenges. Due to smart contract on the network database, security matters are highly needed. Therefore, this study aims to investigate the smart contract issue from the case law and review the court judgment based on relevant legal and regulatory laws applied to the decision. The case law was referred to in Malaysia, Singapore, U.K. and New Zealand. This study adopted a qualitative method in analysing legal practices. The materials for this thesis are gathered from the UTM Database of Lexis Nexis, English Law cases, and relevant regulators and policies.The result found the main issue categorized into three namely technical issues, contractual issues, and legal and regulatory issues. Technical issue is the main contributor to the smart contract such which the oracles of data feeding in the platform is hard to trust and secure in the online platform by the technical glitch in the system due to codes also questioned the enforcement of the legal contract in the contractual issue. Meanwhile, the value of digital assets is volatile and insecure during the exchange between the parties. The vulnerability attached impacted the value of the smart contract and contracting parties faced huge losses of cryptocurrency assets. Hence, contracting parties insist the cryptocurrency be treated as property because the virtual assets can be exchanged for real money and the ownership of the assets. Thus, the legal law and regulations are played important roles to justify the terms in the code of contract and assist the court of law for fair judgment thus remedies are applied to the grief parties. In conclusion, prior to creating the programs and software for the smart contract, all the data must be trustworthy and securely on the online platform. It must precisely and reliable towards the contracting parties which could inherent technical issues and contractual issues. Furthermore, involvement from the government and lawmakers may solidify the regulatory law to enhance the application and benefit of smart contracts in the industry. Later, the operation of the smart contract will be smooth with the enhancement of cyber security in online the platform.

ABSTRAK

Teknologi semakin maju seiring dengan revolusi perindustrian, dan pertumbuhan pasaran teknologi blockchain telah meningkat secara global dan mendapat perhatian dan minat daripada masyarakat. Bentuk baharu mata wang digital kini telah menjadi tonggak dalam kehidupan seharian. Semua platform dalam talian kini melaksanakan transaksi dalam program melalui kontrak pintar. Ciri contrak pintar seperti pemusatan, keselamatan yang tinggi,telus, pantas, menjimatkan dan boleh dikawal selia. Ia tidak lari dari kelemahan yang mana keselamatan rangkaian boleh ceroboh.Maka, pengubahan dan penguatkuasaan undang-undang dan peraturan berkaitan mampu menyelesaikan kes berbangkit di mahkamah berkaitan kontrak pintar. Oleh itu, kajian ini bertujuan untuk menyiasat isu kontrak pintar daripada undang-undang kes dan menyemak penghakiman mahkamah berdasarkan undang-undang undang-undang dan peraturan yang berkaitan yang digunakan untuk keputusan tersebut. Kajian kes berpandukan kes yang ialah dari Malaysia, Singapura,UK dan New Zealand. Kaedah yang digunapakai ialah kualitatif dan bahan kajian didapati dari pangkalan data UTM Lexis Nexis, kes dari Undang-undang Inggeris, Udang-undang serta Peraturan tempatan yang berkaitan. Hasil kajian dapati isu teknikal ialah penyumbang utama iaitu data suapan yang tidak pasti ketelusannya untuk menghasilkan kontrak pintar. Juga isu berkaitan penguatkuasaan undang-undang dan peraturan yang sediada. Disebabkan nilai digital aset tidak menentu dalam pasaran, kesan nilai kepada kontrak pintar juga akan terganggu maka kerugian akan dialami oleh pihak yang berkontrak. Maka, pengiktirafan mata wang krypto secara maya kepada bentuk ‘property’ penting kerana ia boleh ditukar kepada nilai wang yang sebenar dan hakmilik mutlak. Oleh itu, undang-undang dan peraturan memainkan peranan penting untuk mewajarkan terma dalam kod kontrak dan membantu mahkamah undang-undang untuk penghakiman yang adil dengan itu remedi digunakan kepada pihak yang berduka. Kesimpulannya, sebelum mencipta program dan perisian untuk kontrak pintar, semua data mestilah dating dari sumber yang boleh dipercayai dan selamat pada platform dalam talian. Ia mestilah tepat dan boleh dipercayai terhadap pihak yang berkontrak yang boleh menimbulkan isu teknikal dan isu kontrak. Tambahan pula, penglibatan daripada kerajaan dan penggubal undang-undang boleh mengukuhkan undang-undang kawal selia untuk meningkatkan penggunaan dan faedah kontrak pintar dalam industri. Kemudian, operasi kontrak pintar akan berjalan lancar dengan peningkatan keselamatan siber dalam platform dalam talian.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Malaysia is now moving forward, transforming the economy into a digital economy, and levelling up for preparedness towards the 12th Malaysia Plan. A digital economy is defined as economic and social activities involving the production and utilization of digital technology by individuals, businesses, and the government UPEN, (2021). This definition is based on research, analysis, and mutual engagement among major stakeholders in the public and private sectors. Hence, 5G technology was launched at the end of 2021 whilst making Malaysia one of the first countries in the region to build a 5G ecosystem. Thus, it will be a crucial driver to change the digital trajectory of the nation's economy and enhance our capabilities in the Industrial Revolution 4.0 (IR4.0) as industries take full advantage of A.I., robotics, Virtual Reality, software engineering, blockchain technology, smart contract, and other various technological innovations.

This new technology will attract an investor to the country and create high-value jobs, which will generate economic benefits in the long run. Initiatives facilitated by information and communication technology (ICT) are playing an increasingly central role in discourses of transparency, traceability, and collaboration. According to Osunsanmi et al.(2018), manufacturing, banking, and retail sectors have implemented digitization as keys to new approaches for future development and competitive gain, hence efficient business strategies. It would provide business opportunities and enhance productivity, thus providing job clarity and exposure Iqbal et al.(2020).

Recent development in blockchain technology has led to the discovery of a smart contract method to execute contracts by reducing and managing time for contract

management in the aspect of the progress payment, coded contract terms and conditions. A smart contract is an automated computerized protocol that runs on the Blockchain and fundamentally is a computer program that verifies and executes its terms upon the occurrence of the events S Ahmadisheykhsarmast and Sonmez (2018) ; Giancaspro (2017). Nevertheless, once coded and entered into the Blockchain, it cannot be changed and operates following its program Luo et al. (2019).

On 18 October 2016, the Central Bank of Malaysia issued the Financial Technology Regulatory Sandbox to establish a framework of regulatory requirements and procedures to enable innovation and deployment of Financial Technology (Fintech) due to increasing demand and interest in daily digital transactions in Malaysia BNM (2016). Blockchain technologies were used for public transactions and private ledgers for inter-company transactions and record keeping. Thus, blockchain data is resistant to modification and acts as a secure record of the transaction. As a result, it improved visibility and efficiency and can help organizations overcome the challenges posed by the COVID-19 pandemic. Furthermore, according to Christidis and Devetsikiotis (2016) ; Li et al. (2019) ; Hamma-Adama et al. (2020), the data transfer system can be performed without third-party intervention.

According to Statista (2022a), statistic shows that 15.9 per cent of cross-border payments and settlements have become popular with blockchain technologies as they allow for money transfer between countries. This allows consumers and businesses to transmit money internationally, improve remittances, decrease costs, and minimize exposure to cryptocurrencies. In addition, as reported by Statista (2022a), in 2024, the statistic projected that blockchain technology would grow to reach almost a 19million U.S dollars. Whereby, up until 9 January 2022, the transaction process of Cryptocurrency Ethereum is 1million times per day, meaning that the high volume was significantly bigger and demanding market. Furthermore, Ethereum is executed from the smart contract and this payment made through the Cryptocurrency Ethereum known as ‘gas’ Stack Exchange Community (2015).

As the application of Blockchain gets wider and more assets are tokenized, the smart contract will become increasingly complex. The more complex the smart contract, based on the transaction steps to be performed, the more ‘gas’ should be paid

to execute the contract. Hence, the gas function as an essential gate to prevent numerous smart contracts from overwhelming Berg et al.(2021). Nevertheless, the smart contract was defined as a computer transaction protocol that executes the terms of a contract. Hence, the objectives are to satisfy common contractual conditions such as payment terms, liens, confidentiality and enforcement Szabo (1994).In other words, 'smart' is a contract written in the code by a software application and according to the law 'contract' is a set of agreements or promises between parties. It is typically formed through voluntary offer, acceptance, consideration and intent to create a legal action as well as in common law jurisdiction.

Most contracts are presented in writing to keep evidence of the agreed clauses. In some cases, orally or through action such as agreeing to terms an electronic media by clicking or known as 'clickwrap agreements' also can establish the contract Tan et al.(2021). Principally if the codes are satisfying and comply with the four conditions mentioned above, the contract is considered legally binding even though some of the terms in the agreements may or may not be understood by the participants. In the eye of England and Wales law, the conditions must practically applied event thought it has not always specify the form of contract Bacon et al.(2018) ; Vigliotti (2021).

Even though the smart contract would be easy to treat like any other contract, the system itself is irrevocable once coded, and disputes might still arise. Thus, the traditional court system would face difficulties interpreting terms and agreements in code. This is a sometimes-difficult obstacle for the widespread use of smart contracts in complex and regulated areas such as finance. Often, issues arise in the context of the contract expressed in computer code. Later on, it can cause concerns regarding the identity of parties, identification of terms and the creation of the terms, thus the governing law.

Regardless of the innovation of smart contracts, it is recognized legally when they fulfilled the requirements stipulated by the law. In Malaysia, the main reference for smart contracts is Contract Act 1950. Furthermore, according to the previous researcher Husna Zakaria et al.(2018), digital currency exchanges are considered "reporting institutions" under the Anti-Money Laundering, Anti-Terrorism Financing and Proceeds of Unlawful Activities Act 2001 (AMLA), which means that businesses

that are involved in converting cryptocurrencies to authorization money would be required to provide detailed information on buyers and sellers of such currencies. Meanwhile, in the United Kingdom, the U.K. Jurisdiction Taskforce was issued in May 2019, its consultation paper to adapt and deal with fast-changing technologies focusing on the status of crypto assets, distributed ledger technology, and smart contracts in English private law U.K. Jurisdiction Taskforce (2019).

1.2 Problem Background

Jurisdiction around the world has been called on how the crypto assets and related transaction should be treated and protected by the stakeholders as a matter of law ever since digital currencies and smart contract has risen. In November 2008, bitcoin was invented by Satoshi Nakamoto Nakamoto (2008). In 2022 there were 82.22million wallet bitcoins users worldwide. The price is about 38,375.00USD for 1bitcoin Statista (2022b). Later, bitcoin inspired another cryptocurrency, and for instance, Ethereum has created by Vitalik Buterin to handle smart contracts. The smart contract is technology, not merely currencies but contract that resides on the Internet using cryptographic techniques to enforce the associated trust and consensus. However, not many people understand what they are precisely and how relevant to our daily lives.

Cryptocurrency is not a legal tender in Malaysia, and only notes and coins issued by Bank Negara Malaysia, according to Section 24 (Central Bank of Malaysia Act 1958, 1994), shall be legal tender in-country in place of bitcoin is not legal tender when the Bank Negara announced it in January 2014. Despite that, there are no laws prohibiting the exchange or assets for cryptocurrency in Malaysia whilst in January 2018, a businessman in Sabah bought a piece of land for turtle conservation in Libaran Island located in Sabah, even though Bank Negara Malaysia has yet to finalize a clear guideline on the use of cryptocurrency for an ordinary sale and purchase agreement done in bitcoin. As a result, the deal was successfully closed The Straits Times (2018). Later in the same year, a Proton dealer in Seri Kembangan Selangor was suspended by Proton Holdings because he had advertised accepting Bitcoin as a payment method for

the vehicles because the company's policies do not recognize cryptocurrencies CCN News (2018).

1.3 Problem Statement

Undoubtedly, blockchain technology can be applied to create a platform with different features, including access to the ledger, who controls the system and the store ledger, visibility toward viewing the ledger, identity of the users, and automation platform support the smart contract. However, smart contract terms may confuse certain parties or lawyers since they do not refer to a legal contract. Instead, the terms essentially refer to the computer programs coded, and nodes to execute specific actions automatically generate the agreements between parties.

This raises the problem of whether the formation of a smart contract qualified as a legal contract when it was carrying out transfer, executing other actions relating to digital assets for prespecified use for both parties Szabo (1996) because the smart contract depends on a digital ledger system in the Blockchain. In contrast, a traditional contract is performed directly or indirectly, which can be done face-to-face, orally or in understandable language, whereby indirectly is formed via emails, letters, memos, etc., to indicate the offer and acceptance. Later, the contract is treated as binding and sealed between parties in hardcopy or softcopy as an agreement.

In addition, the nature of smart contracts is self-executed and self-verified once developed by coding. Therefore, it can never be modified again, as claimed by Giancaspro (2017) ; (Ahmadisheykhsarmast and Sonmez (2018) Lin William Cong (2018) ; Luo et al.(2019) ; Kizza (2020). However, it still can be modified even though it is tough to place modifications of the nodes in the Blockchain. It will be triggered and alarm everyone in the network. Thus, the issues arise if any circumstance at any state of system error, whether it can be considered the unilateral mistake of careless and negligence thus grief parties reliable for relief.

Later, the legal risk of legal ownership of cryptocurrency and crypto wallets has been neglected. The ownership issues are always debated in multiple court jurisdictions regarding recognizing cryptocurrency as 'property.' The benefits of ownership belong to the owner, who has an equitable title and can claim the assets from the custodian and has priority over the custodian's creditors in the event of the custodian's insolvency. Further, if elements of the criminal offence of theft occurred by the third parties' gaining access to the user's private key and transferring to another account, on what stand the user might claim for the losses. As claimed by Ian Childs, Justin Gan, and Lauren Tang (2021), the cryptocurrency cannot be a reliable form of the subject matter of trust, proprietary right or part of an estate if it has not been recognized as 'property'; hence, what is the essential element to justify the possession can be exercised over the assets.

Thus, this study aims to distinguish the legal issues in smart contracts on the Blockchain by focusing on local and international cases. By analysing the court decisions throughout the legal and regulatory law, a better understanding of the concept and legal position to protect stakeholders with legal remedies towards current legal uncertainty and associated risks.

1.4 Aim and Objective

Therefore, the research aims to profile the legal issues in the context of smart contracts on the blockchain technology. This research purely looks into the smart contract case's law which the objectively of the study is to identify the legal issue of smart contract often rise whereby to understand how the court judgement been made applied based on relevant regulatory and law.

1.5 Scope of the Study

The approach adopted in this research is case law related, and it covers:

(a) Court cases referred in this research from the university's database Lexis Nexis in the Malayan Law Journal (MLJ) and unreported (MLJu), Singapore and English law cases reported in England/United Kingdom Law Journal and Wales.

(b) Malaysia Law and Act: Contract Act 1950, The Guidelines on Digital Assets (Guidelines) are issued by the Securities Commission Malaysia (S.C.) according to section 377 of the Capital Markets and Services Act 2007 (CMSA), Capital Market and Services Act 2007 (Prescription Of Securities) (Digital Currency And Digital Token) Order 2019

(c) English Law and Act: United Kingdom Jurisdiction Taskforce (UKJT), DLT and Smart Contract under English private law May 2019,

(d) New Zealand: N.Z. Trustee Act 1956

(e) Articles from seminar papers and research journals.

1.6 Significance of Study

This research is conducted to identify the issues arising in litigation-involved cases from smart contracts in blockchain technology. To accomplish this study, law cases were selected locally and broadly, namely in Singapore, New Zealand and the U.K., to overview the most often debated issues in this field. Also, the most part is to review the court judgment based on relevant legal and regulatory law applied for the decision. As a result, this study will create a better understanding of the concept of protection, regulation and security legally as a stakeholder because Malaysia has explicitly a prospect of blockchain technology and smart contract to explore, including

the 5G internet could bring changes to the industry whilst the existing regulatory hopefully will accelerate the drive for the start-up.

1.7 Research Methodology

In order to achieve the objective of this research, there is several process and method that will be carried out in four stages: initial study, data collection, data analysis, conclusion, and recommendation.

1.7.1 Initial Study

For the first process, several pieces of information from articles, journals, newspaper cutting, reports and books are combined with the research issues. The information collected within the context of the objective is not limited to the construction industry only but focuses widely on other industries. Instead of case law analysis, Malaysian, Singapore, New Zealand, Australia and U.K. law, act and regulatory also referred.

1.7.2 Data Collection

Secondly, as for descriptive research, the reported or unreported cases from previous court cases, research papers and journals related to Blockchain, and smart contract litigation issues are collected from various valid sources such as the UTM library online database and Lexis Nexis. Meaning that the primary data is the electronic database and secondary data are documentation mentioned earlier.

1.7.3 Data Analysis

Third, from the collectable data and information analyzed using the qualitative descriptive technique, the relevant information was converted and reviewed by focusing on the disputes referred to the court. Later, those arguments and opinions from the court judgment were interpreted and examined with the relevant regulatory law and acted into a writing process. These were to ensure the objective could be achieved.

1.7.4 Completion

Forth, to complete this report writing up shall be done in sequence. The information is interrelated; thus objective has been accomplished. Nonetheless, from the findings, some conclusions and recommendations have been made from the data analysis summary.

1.8 Methodology Process

To meet the aim and objective of this research, the four stages have been illustrated in figure 1.1. Each of the boxes contains a description of how the process started.

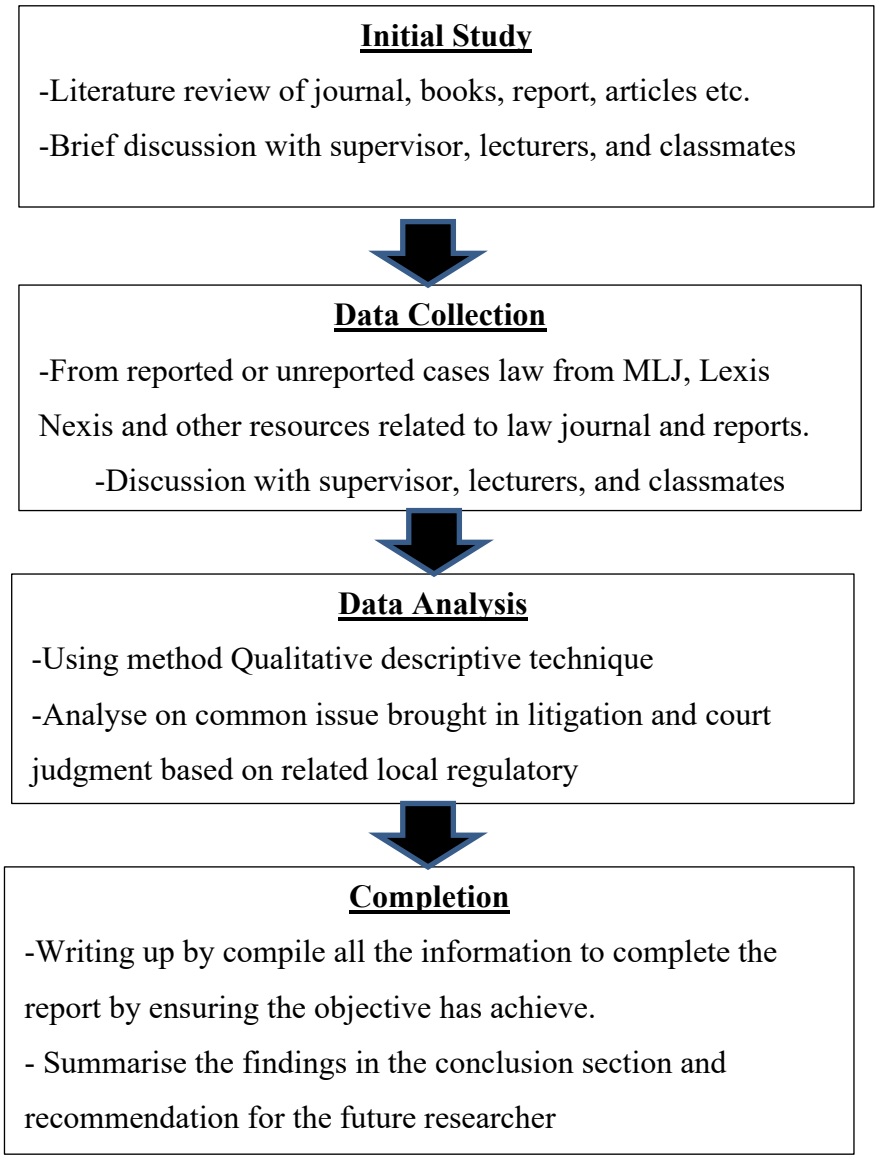

Figure 1.1 Flow Chart of Research Methodology

1.9 Thesis Structure and Organization

1.9.1 Chapter 1: Introduction

This first chapter will briefly define the background of the study, problem background, problem statement, aim and objective, thus scope focusing on the subject matter and significance of this research for educational purposes.

1.9.2 Chapter 2: Smart Contracts in Blockchain

In the second chapter, there will be a discussion about the regulation, legislation or standard policy from authorities' bodies in each country that has been practiced or governance from the selected law cases. This assessment is important to address the court judgment that has evolved the regulatory in the litigation for flourishing the technology.

1.9.3 Chapter 3: Analysis of issues based on the case law.

The third chapter will elaborate on the issues from the cases that have brought both parties into the litigation. Every case law will be analyst the issue and related to the existing issue in the smart contract. The comparison data will be analyst and the output will be elaborate synchronized with the literature review. Each of case actually related because of the characteristic of smart contract itself.

1.9.4 Chapter 4: Conclusion and Recommendations.

The last chapter is about the conclusion from the whole case analysis hence emphasizing research objective and also the recommendation for the future research. The conclusion made from the analysis gather from all four cases. Every issue in each case will be inserted in the table for easy reference and divided into three main categories. By the end of this study, researcher will recommend the suitable area for the next researcher to emphasized application of smart contract especially in construction industry.

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