



2019

Hitting the White Ball: The Technology Neutrality Principle and Blockchain-Based Applications

Anne Veerpalu

Eduardo da Cruz Rodrigues e Silva

Follow this and additional works at: <https://repository.nls.ac.in/ijlt>



Part of the [Law Commons](#)

Recommended Citation

Veerpalu, Anne and Rodrigues e Silva, Eduardo da Cruz (2019) "Hitting the White Ball: The Technology Neutrality Principle and Blockchain-Based Applications," *Indian Journal of Law and Technology*. Vol. 15: Iss. 2, Article 2.

DOI: 10.55496/PJEB9967

Available at: <https://repository.nls.ac.in/ijlt/vol15/iss2/2>

This Article is brought to you for free and open access by Scholarship Repository. It has been accepted for inclusion in Indian Journal of Law and Technology by an authorized editor of Scholarship Repository.

HITTING THE WHITE BALL: THE TECHNOLOGY NEUTRALITY PRINCIPLE AND BLOCKCHAIN-BASED APPLICATIONS

Anne Veerpalu & Eduardo da Cruz Rodrigues e Silva***

ABSTRACT *This article provides a legal analysis model for legislators to employ in order to identify non-compliance with the technology neutrality principle in cases of use of blockchain technology. The principle of technology neutrality is aimed at supporting innovation and competition. The article uses the treatment of an application called CUBER in Estonia as early as in 2014 as an example for such analysis. The CUBER mobile application used blockchain technology to execute payment transactions for goods and services. The article first portrays the challenges that the technology neutrality principle poses on existing regulation. It then explores whether technology discrimination took place against CUBER and how this could have been avoided through compliance with the technology neutrality principle. Through this analysis, the article maps the challenges that all start-ups encounter when initiating the use of a new technology aiming to innovate an existing process.*

I. Introduction	301	Obligation to Apply for an E-Money License?	316
II. The Principle of Technology Neutrality in European Union.	303	D. The Origin of the Limitations Stated in Section 6(5) of the PIEIA	316
III. Circumstances of the CUBER Case and its Technical Setup	306	V. Was the Limitation in Section 6(5) of the PIEIA Technology Neutral?	318
IV. E-Money Regulation	308	VI. Conclusion	319
A. The E-Money Directives and Their Transposition	309		
B. Did CUBER Qualify as E-Money Under the PIEIA?	313		
C. Was LHV or the LHV Start-up Under the			

* Anne Veerpalu is an attorney-at-law and a PhD candidate of Law, University of Tartu, Estonia. Anne constructed the structure of the research, conducted the data search and the interviews, drafted the first version of the article and edited the final version of the article.

** Eduardo da Cruz Rodrigues e Silva is an associate of NJORD Law Firm and holds a Master's degree in Law and Technology from TalTech, Estonia. Eduardo researched the e-money regulation's historical perspective, the securities regulation, edited the first draft and re-edited the draft article after peer-reviews.

I. INTRODUCTION

The applications of blockchain technology can broadly be classified under financial and non-financial heads.¹ Cryptocurrencies, issuance of securities, trading, settlement, and insurance are identified as common financial areas of application, while proof of existence of documents, data storage, internet of things, internet applications, notarisation, music licensing, and anti-counterfeit solutions are popular non-financial areas of application identified. Blockchain technology is, in its essence, a data recording technology that can either be centralised or decentralised. The centralised-decentralised aspect of the blockchain relates to the existence or non-existence of a trusted centralised party administering the blockchain.

Blockchain applicabilities are represented by coins or tokens which concretise the specific rights that are attributed to the coin or token holder. As the applicabilities of blockchain are distinct and cover different areas, it is evident that different laws may apply depending on the nature of the application.

Bitcoin refers to a software which uses blockchain as is its underlying protocol to create a decentralised version of electronic cash. Payment of Bitcoin can be made directly between the parties to a transaction, without the need for a trusted centralised third party, i.e., without the supervision of a financial institution. The Bitcoin protocol establishes a network that solves the problem of double spending by time stamping transactions into a chain of hash-based proof-of-work verified blocks. The creator of any new block – called a miner – is rewarded with Bitcoins as compensation and there is no additional transaction fee from the network for the parties to the transaction. The network is called ‘trustless’ because there is an economic incentive for the miners (creators of new blocks) to obey the rules of the network without supervision by a centralised operator since “*it is more profitable to play by the rules than to undermine the system*”.² Bitcoin, as a unit, is identified by Nakamoto as an electronic coin.³

In order to prevent discrimination against new technologies, it is important to ensure that the application of existing regulations is compliant with the principle of technology neutrality. The principle of technology neutrality

¹ Michael Crosby and others, ‘Blockchain Technology: Beyond Bitcoin’ (2016) 2 Applied Innovation Review <<http://scet.berkeley.edu/wp-content/uploads/AIR-2016-Blockchain.pdf>> accessed 10 February 2020.

² Satoshi Nakamoto, ‘Bitcoin: A Peer-to-Peer Electronic Cash System’ (2008) Bitcoin White Paper <<https://bitcoin.org/bitcoin.pdf>> accessed 10 February 2020.

³ Nakamoto (n 2).

is included in various legal texts in the European Union ('EU') and in essence means that all technologies should be treated equally, not some preferred and some discriminated against. The E-Money Directive⁴ introduces the principle of technology neutrality in its Recital 7, which states:

It is appropriate to introduce a clear definition of electronic money in order to make it technically neutral. That definition should cover all situations where the payment service provider issues a pre-paid stored value in exchange for funds, which can be used for payment purposes because it is accepted by third persons as a payment.

This means that the electronic money ('e-money') definition should not prefer that a specific technology be employed in allowing for the use of e-money.

Each EU member state is required to transpose EU directives into its national laws, respecting the same principles. This article is based on the e-money regulation of Estonia, and explores whether the technology neutrality principle survived the transposition of the E-Money Directive into Estonia's national law.

The case under analysis is the implementation of the Estonian e-money regulation on a mobile application called CUBER that was developed in 2014 by a local bank in Estonia – AS LHV Pank ('LHV'). The CUBER mobile application used blockchain technology to execute payment transactions for goods and services.

The Estonian Financial Supervisory Authority ('the FSA') qualified CUBER as e-money⁵ under the Payment Institutions and E-money Institutions Act ('the PIEIA'),⁶ which meant that only 1,000 - 2,500 euros of CUBER were allowed to be used per e-money device (device using the CUBER application) during a calendar year. This limitation substantially restricted the use of the CUBER application by LHV's clients. The respective limitations in the PIEIA were repealed on 13 January 2018, upon the initiative of the Ministry of Finance, which by then had realised that the limitations were linked to

⁴ Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC, OJ L 267 (E-Money Directive).

⁵ The FSA refused to confirm or comment on this statement. It did not consent to LHV releasing the qualification provided by the FSA to LHV or to LHV sharing the material on the case with the authors for the benefit of this research, knowing that LHV had consented to such data sharing. The relevant emails are held with the authors.

⁶ See, Payment Institutions and E-money Institutions Act 2010 (PIEIA).

the outcome that not a single entity had applied for an e-money license in Estonia.⁷

Legal analysis of such cases is important as lessons learned could help identify non-sustainable regulation, assist in the implementation of existing regulation, and avoid discriminatory practices against innovative new business models or uses of technology. Any preferential treatment of existing technologies and the status quo of the market might qualify as protectionist, and therefore, against the principle of technology neutrality.

Since it is questionable whether the CUBER application should have been subjected, in the first place, to the PIEIA and its limitations on use, the research questions of the article are as follows:

- (i) Was an old concept of e-money device disproportionately implemented on a new blockchain technology-based mobile application?
- (ii) Was the implementation of the PIEIA's limitations on the use of e-money devices compliant with the principle of technology neutrality, in the context of the new innovative technology?

The case analysis is based on information publicly available and that communicated by the Head of the Legal Department of LHV.

The article is structured as follows: Section II provides an overview of the principle of technology neutrality in EU legislation and of the principle's application to the e-money regulation. Section III then discusses the circumstances of the CUBER case, the characteristics of CUBER, and its technical setup. Section IV examines the implementation of Estonia's e-money regulation on CUBER and the question of whether it should have been applied at all to the application. Finally, Section V provides a summary of the conclusions drawn in the article.

II. THE PRINCIPLE OF TECHNOLOGY NEUTRALITY IN THE EUROPEAN UNION

The technology neutrality principle is included in Recital 15 of the General Data Protection Regulation⁸ and Recital 16 of the EU Regulation on

⁷ Letter by the Ministry of Finance to Mr Mihhail Stalnuhhin of the Finance Committee of the Estonian Parliament (11 October 2017) (in Estonian, held by the authors).

⁸ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC, OJ L 119.

Electronic Identification, Authentication and Trust Services (eIDAS).⁹ Those recitals respectively state that the “*protection of natural persons should be technologically neutral and should not depend on the techniques used*” and that “*it should be possible to achieve the necessary security requirements through different technologies*”. This means that the use of blockchain technology for certain regulated applications should not, by itself, be reason for differential treatment.

Van der Haar introduces four rationales¹⁰ behind the technology neutrality principle, which are as follows:

- (i) The *non-discrimination* rationale requires that regulation does not favour one technology over the other, as otherwise, discriminatory rules would distort competition and the market. Achieving non-discrimination does not require major regulatory changes.
- (ii) The rationale of *sustainability* indicates that the principle of technology neutrality requires regulation to be flexible and open to technological change. By not being specific to a technology, regulation becomes future-proofed as existing regulation can apply to technologies not existing at the time of its drafting. However, van der Haar highlights that application of the sustainability rationale could also lead to a decrease in legal certainty.
- (iii) A slightly different rationale is that of *efficiency*, which calls for the creation of dynamic, functional rules that can evolve with technological developments. It is not sufficient to have non-discriminatory or future-proofed rules which are static, but it is essential that regulation be able to respond to changing market conditions.
- (iv) The fourth rationale, which is presented from the natural persons’ perspective, is *denominated consumer certainty*. As per this rationale, when services are considered by consumers as interchangeable, technology neutrality would ensure that such services are regulated in a similar manner.

These four rationales provide different perspectives on the complexity of the technology neutrality principle and how variable its application to blockchain technology can be. This also means that there are different legislative

⁹ Regulation (EU) No. 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC, OJ L 257.

¹⁰ IM van der Haar, ‘The principle of technological neutrality: Connecting EC network and content regulation’ (PhD thesis, Tilburg University 2008) <<https://pure.uvt.nl/ws/portalfiles/portal/1063437/3240352.pdf>> accessed 10 February 2020.

and regulatory paths that states may follow when applying existing laws to blockchain technology applications.

Next, we study Reed's¹¹ explanation of the technology neutrality principle through: (i) the different meanings of the principle; (ii) the categories of technology neutral regulation; and (iii) the example of the E-Money Directive's¹² compliance with technology neutrality.

According to Reed, one of the meanings attributed to the principle of technology neutrality is that the same fundamental rules should apply irrespective of the online or offline nature of the regulation object. This must not be confused with cases where there exists a single rule applicable irrespective of the context. The shortcoming of applying identical rules to different regulation objects is that distinctions between the objects will mean that "*the effect of the rules is different as between them*". Accordingly, Reed clarifies that "*technologically neutral rules addressing the same issue may differ in their wording and content, in order to achieve the same effects when applied to different technologies.*"¹³ The other meaning of the technology neutrality principle is the idea that rules should not discriminate against a particular technology.¹⁴

Reed considers that regulation may be classified under three heads, from the point of view of technology neutrality. These are: (i) *technology indifferent* regulation; (ii) *implementation neutral* regulation; and (iii) *potential neutral* regulation.

First, *technology indifferent* regulation requires rules to apply equally in both online and offline contexts. Regulation is indifferent to what technology is used. It instead regulates behaviour and consequent effects, and not the means used to achieve the effects.

Second, *implementation neutral* regulation means that when technology-specific regulation is introduced, it does not favour one technology over another and ensures equivalent implementation effect on different technologies. Reed gives the following example for implementation neutral regulation: "*the issuance of e-money is so fundamentally different an activity*

¹¹ Chris Reed, 'Taking Sides on Technology Neutrality' (2007) 4(3) SCRIPTed – A Journal of Law, Technology & Society 263 <<https://script-ed.org/wp-content/uploads/2016/07/4-3-Reed.pdf>> accessed 10 February 2020.

¹² Directive 2000/46/EC of the European Parliament and of the Council of 18 September 2000 on the taking up, pursuit of and prudential supervision of the business of electronic money institutions, OJ L 275.

¹³ Reed (n 11).

¹⁴ Reed (n 11).

from the printing of banknotes and minting coins that it would clearly be difficult, if not impossible, to regulate both activities by means of the same legal rules.”¹⁵

Finally, *potential neutral* regulation refers to situations where specific regulation is required to achieve an essential legal result and as a consequence, the law regulates a special technological attribute. The key factor for a law to be potentially neutral is the presence of legal requirements in the law which permit other technologies to become compliant.

For the purposes of the article, the questions are: what is considered an issuance; and whether the fact of payments made with CUBERs through a mobile application using funds in a bank account would qualify as an issuance of e-money, or whether this would merely be a payment service, since LHV was allowing the mirroring of CUBERs as money in the bank account.

In the following section, the CUBER application and its technical setup are introduced.

III. CIRCUMSTANCES OF THE CUBER CASE AND ITS TECHNICAL SETUP

On 13 June 2014, a news report stated that LHV had become the first credit institution in the world to hire a cryptocurrency expert.¹⁶ LHV was developing an innovative product called CUBER, which was an experiment to issue “100,000 EUR worth of cryptographically protected claims against bank into Bitcoin blockchain”.¹⁷ This meant that CUBER was built as an application on the Bitcoin blockchain.

In essence, LHV was testing a technology application which used both a centralised banking system and a new innovative technology, namely tokens,¹⁸ when the global economy was still coming to terms with Bitcoin.

¹⁵ Reed (n 11).

¹⁶ Hans Lõugas, ‘LHV palkas esimese pangana maailmas bitcoin’i-spetsialisti’ (*Eesti Päevaleht*, 13 June 2014) <<https://epl.delfi.ee/eeesti/lhv-palkas-esimese-pangana-maailmas-bitcoin-i-spetsialisti?id=68871319>> accessed 10 February 2020 (in Estonian).

¹⁷ See, ‘CUBER – LHV Bank started public use of blockchain technology by issuing securities’ (*cuber*, 8 June 2015) <http://www.cuber.ee/en_US/news/> accessed 10 February 2020.

¹⁸ According to the European Securities and Markets Authority (ESMA), “Tokenisation is a method that converts rights to an asset into a digital token. It is effectively a means to represent ownership of assets on DLT. Virtually anything can be tokenised, ranging from physical goods to traditional financial instruments”. See, ESMA, *Advice: Initial Coin Offerings and Crypto-Assets* (ESMA50-157-1391, 9 January 2019) 7, 8 <https://www.esma.europa.eu/sites/default/files/library/esma50-157-1391_crypto_advice.pdf> accessed 10 February 2020.

CUBER was designed as a coloured coin,¹⁹ which meant that “*an amount of Bitcoin [was] repurposed to express another asset.*”²⁰ As aptly summarised by Antonopoulos:

Colored coins are managed by specialized “wallets” that record and interpret the metadata attached to the “colored” bitcoins. Using such a wallet, the user will convert an amount of bitcoins from uncolored currency, into colored coins, by adding a label that has a special meaning. For example, a label could represent stock certificates, coupons, real property, commodities, collectible tokens, etc. To color the coins, the user defines the associated metadata, such as the type of issuance, whether it can be subdivided into smaller units, a symbol and description, and other related information. Once colored, these coins can be bought and sold, subdivided, aggregated and receive dividend payments. The colored coins can also be “uncolored” by removing the special association and redeeming them for their face-value in bitcoin.²¹

CUBER is an acronym for Cryptographic Universal Blockchain Entered Receivables, and according to its website, it is a “*technically new kind of certificate of deposit and is meant to be a building block for various innovative financial products.*”²² Nowadays, such units are called ‘tokens’, and these are generally categorised under three different heads, as examined further in section IV B.²³

CUBER’s product development was separated from the bank by way of a financial technology start-up, OÜ CUBER TECHNOLOGY (‘the LHV start-up’), which was a subsidiary of the LHV Group. The LHV start-up had developed an iOS and Android CUBER application, namely CUBER Wallet, together with Swedish ChromaWay, which was meant for the use of CUBER as “*fast, free, P2P mobile fiat currency payment*”.²⁴ In the testing phase of CUBER, the application was used for payments in the cafeteria of LHV’s building.

¹⁹ See, cuber (n 17).

²⁰ Andreas M Antonopoulos, *Mastering Bitcoin* (1st edn, O’Reilly 2014).

²¹ Antonopoulos (n 20).

²² See, cuber (n 17).

²³ Securities and Markets Stakeholder Group, *Advice to ESMA: Own Initiative Report on Initial Coin Offerings and Crypto-Assets* (ESMA22-106-1338, 19 October 2018) <https://www.esma.europa.eu/sites/default/files/library/esma22-106-1338_smsg_advice_-_report_on_icos_and_crypto-assets.pdf> accessed 10 February 2020.

²⁴ See, cuber (n 17).

Unfortunately, LHV's initiative was short-lived – since June 2015,²⁵ there have been no updates on the project website, and although no official notice of suspension of the project has been communicated to the public, according to Mr. Daniel Haab,²⁶ Head of the Legal Department of LHV, the project was terminated in 2015 for various reasons. Among these was the FSA's qualification of CUBER as e-money²⁷ under the PIEIA.²⁸ This qualification as such was not detrimental, however, the limitation of use under Section 6(5) of the PIEIA was. The limitation stated:

Up to 1000 euros of e-money may be stored on an e-money device if the e-money device does not allow repeated storage of e-money (hereinafter recharging). If it is possible to recharge an e-money device, up to 2500 euros of e-money may be stored or recharged on the e-money device during a calendar year.

Accordingly, LHV could only issue 2,500 euros worth of CUBER per user per year.

While this does not mean that there were no other convincing reasons for the termination of the CUBER project, this article focuses on the regulatory obstacles faced due to the qualification of CUBER as e-money and the respective limitations of issue.

The next section explores the e-money regulation of the time and the qualification of CUBER as e-money under the regulation.

IV. E-MONEY REGULATION

The usage of e-money surged with the advent of the Internet, and its adoption has permitted the development of new payment methods using novel technologies. E-money was not developed during this decade or century but was first recognised as a concept in 1983.²⁹

²⁵ See, cuber (n 17).

²⁶ One of the authors both met with Mr Haab and has an email from Mr Haab on file confirming the same.

²⁷ The FSA refused to confirm or comment on this statement. It did not consent to LHV releasing the qualification provided by the FSA to LHV or to LHV sharing the material on the case with the authors for the benefit of this research, knowing that LHV had consented to such data sharing. The relevant emails are held with the authors.

²⁸ PIEIA, s 6(1).

²⁹ D Chaum, 'Blind signatures for untraceable payments' in D Chaum et al (eds), *Advances in Cryptology* (Springer 1983) 199-203.

A. The E-Money Directives and Their Transposition

In the EU, the first legislation that specifically targeted e-money was Directive 2000/46/EC on the taking up, pursuit of and prudential supervision of the business of e-money institutions, which was to be transposed by Member States by 27 April 2002. Since then, the technical evolution and growth of new mechanisms of e-money has progressed at a fast pace. Further, Directive 2000/46/EC suffered from certain limitations, due to which the second E-Money Directive (Directive 2009/110/EC on the taking up, pursuit and prudential supervision of the business of e-money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC), which is presently in force, was adopted in 2009 and was required to be transposed by all Member States by 30 April 2011. The second E-Money Directive was transposed into Estonian law through the enactment of the PIEIA.

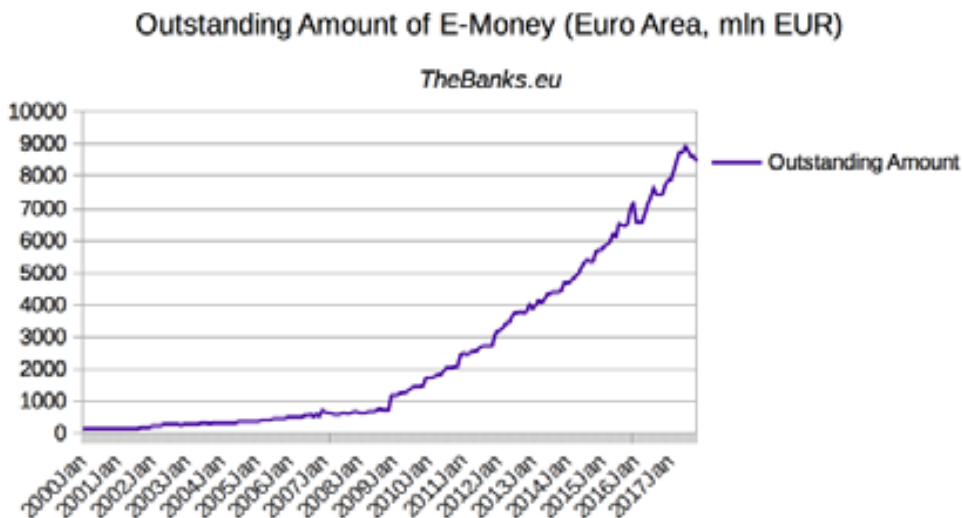


Figure 1: Outstanding Amount of E-Money³⁰

In Figure 1, we see the total amount of outstanding e-money in the Eurozone from 2000 to 2017. This figure shows the amount of money that was received for the issuance of e-money, as there is a requirement for issuance of e-money at par value of euro amount received. As can be seen, there is a stagnation between the years 2000 and 2009, and a clear increase of the outstanding amount since 2009. The initial years of stagnation correspond to the period when the first E-Money Directive was in force and where e-money was almost non-existent, while the subsequent period post 2009

³⁰ 'Electronic Money Institutions in Europe' (*TheBanks.eu*, 2 July 2019) <<https://thebanks.eu/articles/electronic-money-institutions-in-Europe>> accessed 10 February 2020.

corresponds to the entry into force and transposition of the second E-Money Directive.

The first E-Money Directive prescribed a restriction on e-money institutions that forbade them from providing services not connected with the issuance and administration of e-money. The position of the United Kingdom's Financial Conduct Authority at the time, considering that the E-Money Directive regime and its licensing obligations would apply to telecommunication operators, was that telecommunication service providers could not provide telecommunication services since those were not closely related to the issuance and administration of e-money.

According to Reed, the first E-Money Directive³¹ was contrary to the technology neutrality principle as it fell afoul of *implementation neutral* regulation. The reason for this conclusion is connected to the existence of three different legal regimes that could apply to the activity of transferring funds to a third party: (i) the credit institution regime; (ii) the e-money institution regime; and (iii) the payment institution regime. In comparison with the other two regimes, the first E-Money Directive contained restrictive requirements, one of which was that the activities of e-money institutions must be limited to providing only those services which were closely related to the issuance and administration of e-money. The combined effect of these requirements were, in Reed's opinion, "*to make e-money issuance only marginally profitable*".³² This created an imbalance that led to preferential treatment of payment and credit institutions in contrast to e-money institutions, as the former could also provide additional services beyond that of issuance and administration. The payment institution regime was especially incomparable as it allowed for more freedom in the provision of services, in prescribing lower capital and liquidity requirements.³³

Furthermore, Reed argues that "*the choice in the E-Money Directive to regulate the issuance of e-money, rather than the provision of e-payment services, was one of the reasons why this legislation was not implementation neutral.*"³⁴ This means that the e-money institutions were tied to the service of issuance and could not use e-money for payment services. Most

³¹ Directive 2000/46/EC of the European Parliament and of the Council of 18 September 2000 on the taking up, pursuit of and prudential supervision of the business of electronic money institutions, OJ L 275.

³² Reed (n 11).

³³ Reed (n 11).

³⁴ Reed (n 11).

e-money issuers would – if the first E-Money Directive had allowed it – carried on payment services in addition to the issuance of e-money.

One of the main ideas underlying the principle of technology neutrality is that of online and offline equivalence. When human relations regulated by law have functional equivalence online and offline, the same/equivalent set of rules should apply. According to Reed, the drafters of the first E-Money Directive found equivalence between e-money businesses and payment systems operated by deposit-taking banks, which led to the application of equivalent laws from the latter to the former. Reed adds that the second E-Money Directive “*abandons the deposit-taking bank analogy in favour of a more generic model of payment service regulation which was developed in the light of modern, on-line payment services.*”³⁵

We can conclude that the second E-Money Directive had a positive effect on the usability of e-money. The sudden and consistent increase of the outstanding amount of e-money can be explained by the ability of e-money institutions to provide services not solely related to the issuance of e-money, which in turn eliminates the comparative disadvantage that existed vis-à-vis the payment institution regime.

However, the statistics in Figure 2 indicate that even the second E-Money Directive, despite its harmonising effect, failed to equalise the situation for all Member States. The figure portrays the total e-money institution licenses issued per EU Member State (since the time the respective domestic regulations entered into force).

Country	Number of E-money Institutions	Country	Number of E-money Institutions
Austria	0	Belgium	7
Bulgaria	5	Croatia	3
Cyprus	13	Czech Republic	2
Denmark	2	Estonia	1
Finland	0	France	13
Germany	8	Greece	2
Hungary	1	Ireland	8
Italy	7	Latvia	2

³⁵ Chris Reed, ‘Online and offline equivalence: aspiration and achievement’ (2010) 18 (3) International Journal of Law and Information Technology 248.

Country	Number of E-money Institutions	Country	Number of E-money Institutions
Lithuania	55	Luxembourg	8
Malta	16	Netherlands	3
Poland	0	Portugal	1
Romania	0	Slovakia	1
Slovenia	2	Spain	5
Sweden	3	United Kingdom	150

Figure 2: E-Money Institution licenses issued in the respective EU Member States³⁶

As can be seen, the United Kingdom and Lithuania have been the main jurisdictions issuing e-money institution licenses, followed by Malta, Cyprus and France. The majority of EU Member States have issued a residual number of e-money institution licenses. Moreover, the number of e-money institution licenses issued per EU Member State is not proportionate to the population and economic weight of the Member State. For example, Estonia has only managed to issue a single e-money institution license, and that too, as recent as September 2019,³⁷ yet, its neighbouring state Lithuania has issued 55 licenses. The discrepancy in the number of licences issued may be attributed to the regulatory arbitrage of applicants who choose jurisdictions that are more appealing in terms regulatory differences, and not simply to an unwillingness of these Member States to issue licenses. For instance, a significant obstacle for applicants in Estonia was Section 6(5) of the PIEIA, which as discussed earlier, imposed a limitation of 1,000 or 2,500 euros per e-money device per year.

The next sections investigate the applicability of the PIEIA's definition of 'e-money' to CUBER, and the question of whether LHV or its start-up should have been treated as an obligated entity under the PIEIA. The origin of Section 6(5) of the PIEIA is also discussed, in order to substantiate the conclusions reached.

³⁶ Compiled from the European Banking Authority's register of payment and electronic money institutions under PSD2 (as of 23 September 2019) <<https://eba.europa.eu/risk-analysis-and-data/register-payment-electronic-money-institutions-under-PSD2>> accessed 10 February 2020.

³⁷ Estonian Financial Supervision and Resolution Authority, *in House Pay AS sai e-raha asutuse tegevusloa* (10 September 2019) <<https://www.fi.ee/et/uudised/inhouse-pay-sai-e-raha-asutuse-tegevusloa>> accessed 10 February 2020 (in Estonian).

B. Did CUBER Qualify as E-Money Under the PIEIA?

The E-Money Directive defines e-money in the following manner:

“electronic money” means electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions [...], and which is accepted by a natural or legal person other than the electronic money issuer.

The PIEIA, in transposing the definition from the E-Money Directive, thus stated that an object must meet the following criteria to qualify as e-money:

- (a) it is monetary value stored on an electronic medium;
- (b) it expresses a monetary claim against the issuer;
- (c) it is issued at par value of the amount of the monetary payment received;
- (d) it is used as a payment instrument to execute payment transactions;
- (e) it is accepted as a payment instrument by at least one person who is not the issuer of the same e-money.³⁸

According to Mr. Daniel Haab of LHV, the FSA qualified CUBER as e-money under the PIEIA, which it considered to have fulfilled all the above-stated criteria. For the present analysis, the CUBER product is described on the basis of facts retrieved from the CUBER website.³⁹ The PIEIA valid at the time of the CUBER project has been used to analyse whether CUBER qualified as e-money under the law.

The analysis shows the following result:

- (a) CUBER had monetary value because it served the function of a means of exchange and was a representation of fiat currency;
- (b) CUBER was issued and stored in a blockchain technology-based application, which is an electronic medium;
- (c) In purchasing CUBER from LHV, a claim was acquired against LHV who was the issuer of CUBER, and the claim amount was the amount of the value of CUBER, meaning that the CUBER expressed a monetary claim against the issuer;

³⁸ PIEIA, s 6(1).

³⁹ ‘Conditions of use of the CUBER APP during the test period’ (*cuper*, 11 May 2015) <http://www.cuber.ee/en_US/terms/> accessed 10 February 2020.

- (d) CUBER represented the value of the monetary amount received and was thus issued at par value of such amount;
- (e) CUBER could be used as a means of payment to third parties for acquiring goods or services. In other words, CUBER could be used as a payment instrument;
- (f) CUBER was accepted by the cafeteria of the LHV building and was thus, accepted by at least one person other than the issuer.

Thus, CUBER appears to satisfy all the above-stated criteria to qualify as ‘e-money’ under the PIEIA. However, according to Section 6(6) of the PIEIA, deposits or other repayable funds within the meaning of Section 4 of the Credit Institutions Act shall not be deemed as e-money. Since CUBER may be considered a representation of a deposit, Section 6(6) exempts it from being classified as ‘e-money’.

CUBER’s website describes it as a “*technically new kind of certificate of deposit*”, without any additional characteristics. In contrast, its treatment as e-money under the PIEIA presupposes that CUBER is something more than a mere use of deposited funds in the bank for payment. Such treatment, however, is flawed. CUBER was a mobile application that used Bitcoin blockchain and coloured coins technology to allow users to pay using money already deposited in their bank account. Thus, it seems redundant to qualify the mere mirroring of the same deposits into CUBERs, as falling under a different and more restrictive regime than that which would apply to credit institutions. In essence, treating CUBERs as e-money would mean that the difference in treatment was simply related to the distinct label of the deposits, i.e., CUBER, and the use of blockchain technology as infrastructure for payments. This, in turn means that the option to utilise the deposits for payment for goods and services was discriminated against once a different technology was used.

The argument that CUBER should not have been treated as e-money is reinforced by examining the example of the more recent concept of tokens and its categorisation by the European Securities and Markets Authority (‘the ESMA’).⁴⁰ The ESMA classifies tokens under three different token types: (i) payment tokens, (ii) utility tokens, and (iii) asset tokens.

- (i) Payment tokens are a means of payment for acquiring goods or services. The holder has no claim on the issuer. These tokens are virtual

⁴⁰ ESMA (n 18).

currencies in the true sense of the word. The most prominent example is Bitcoin.

- (ii) Utility tokens are intended to provide access to a specific application or service but are not accepted as a means of payment for other applications.
- (iii) Asset tokens represent assets such as debt or equity claims on the issuer. Asset tokens promise, for example, a share in future company earnings or future capital flows. In terms of their economic function, asset tokens are thus analogous to equities, bonds or derivatives. Tokens which enable physical assets to be traded on the blockchain also fall into this category.⁴¹

As per the ESMA classification, CUBER was certainly not a utility token because its purpose was to be used as a general means of payment. This leaves the categories of payment token (since CUBER was used as a means of payment in the form of a deposit) and asset token (since CUBER served as a certificate of deposit). However, a payment token does not represent a claim against the user. CUBER, in contrast, represented a claim against LHV and would thus, not qualify as a payment token. Next, it would be redundant to categorise CUBER as an asset token since it represented nothing more than the par value of the fiat currency that it was issued against. The only difference is that CUBER relied on a decentralised Bitcoin blockchain-based infrastructure rather than a centralised bank infrastructure to make payments. Therefore, CUBER should not be qualified as any of the above token categories and must merely be regarded as a representation of the deposited funds in the bank account.

In summary, the authors argue that CUBER should not be qualified as e-money as this requires LHV to apply the e-money institution regime over and above the credit institution regime, and no additional legal certainty is achieved through such overlap. Furthermore, CUBER represented claims against LHV and not the LHV start-up, and LHV being a licensed credit institution was authorised to issue e-money according to Section 6(7)(3) of the PIEIA.

The fact of the matter is that CUBERs merely mirrored bank account deposits and the novel infrastructure (Bitcoin blockchain) used for paying with these deposits should not trigger additional legal norms, as this would run afoul of the technology neutrality principle. Any contrary approach would be analogous to saying that a car travelling on a private road

⁴¹ Securities and Markets Stakeholder Group (n 23).

(centralised infrastructure) should be treated somewhat differently than the same car travelling on a public road (decentralised infrastructure).

C. Was LHV or the LHV Start-up Under the Obligation to Apply for an E-Money License?

According to Section 14(1) of the PIEIA, a company wishing to operate as an e-money institution must apply for an e-money license. Section 7(1) of the same act states that an e-money institution is a public or private limited company, the permanent activity of which is the issuance of e-money in its name. CUBER can be considered as a representation of deposits and it does not qualify as e-money, pursuant to Section 6(6) of the PIEIA. Consequently, there is no requirement to obtain an e-money license from the FSA for the CUBER application. Further, the LHV start-up was not subject to the obligation to apply for an e-money license because it was not the issuer of CUBER – which, in fact, was LHV.⁴²

Even assuming that CUBER was indeed e-money and that the LHV start-up was its issuer, there was still no obligation to apply for an e-money institution license, due to the exemption in the law for a float limit of 500,000 euros. Section 12(1)(1) of the PIEIA provides that e-money service providers whose average outstanding e-money does not exceed 500,000 euros are exempt from the requirements of the act. In case of CUBER, the outstanding e-money was planned to be in the amount of 100,000 euros.

Finally, CUBER represented claims against LHV and not the LHV start-up, and the bank being a licensed credit institution was also not under any obligation to apply for a separate license for issuing CUBER because Section 6(7)(3) of the PIEIA permits the issuance of e-money by credit institutions.

D. The Origin of the Limitations Stated in Section 6(5) of the PIEIA

To the knowledge of the authors, the qualification of CUBER as e-money was not contested by LHV. According to Mr Haab,⁴³ the FSA interpreted each

⁴² “OÜ CUBER TECHNOLOGY offers an innovative solution for using CUBERs – the CUBER APP application. The CUBER APP allows to use CUBERs in payment for goods and services purchased from merchants who have joined the programme, or for transfer to other CUBER APP users. (...) A customer relationship with AS LHV Pank shall only be required if CUBERs are to be acquired from or redeemed by AS LHV Pank.” See, cuber (n 39).

⁴³ Email of Mr Haab to the authors (19 October 2017) (held with the authors). The authors contacted the FSA to confirm this interpretation, but they have not responded to this

user's mobile device with the CUBER application to be a separate e-money device, and since the CUBER application was considered a rechargeable e-money device under Section 6(5) of PIEIA, this meant that only up to 2,500 euros of e-money per mobile device was allowed to be stored on the application during a calendar year. This was a considerable hindrance on the use of the CUBER application and as per Mr. Haab, the project proved to be unviable with such limitation.

In examining the source of this limitation, we find that it originated in the current E-Money Directive. However, these specific articles⁴⁴ were directed at transposing amendments to the 3rd Anti-Money Laundering Directive⁴⁵ and should instead have been transposed into the Money Laundering and Terrorist Financing Prevention Act of Estonia.⁴⁶ The respective Directive transposition conformity assessment⁴⁷ leaves the transposition of the respective article outside the scope of analysis because, in our understanding, its transposition can only be assessed under a conformity assessment of the 3rd Anti-Money Laundering Directive.

Instead, in Estonia, the Ministry of Finance transposed these limitations in 2011 into the PIEIA and repealed these only in 2018.⁴⁸ The repeal entered into force on 13 January 2018 and its explanatory note stated:

request or published the documentation on this interpretation.

⁴⁴ E-Money Directive, art 19: Member States may allow the institutions and persons covered by this Directive not to apply customer due diligence in respect of:

Electronic money, as defined in point 2 of Article 2 of Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions where, if it is not possible to recharge, the maximum amount stored electronically in the device is no more than EUR 250, or where, if it is possible to recharge, a limit of EUR 2500 is imposed on the total amount transacted in a calendar year, except when an amount of EUR 1000 or more is redeemed in that same calendar year upon the electronic money holder's request in accordance with Article 11 of Directive 2009/110/EC. As regards national payment transactions, Member States or their competent authorities may increase the amount of EUR 250 referred to in this point to a ceiling of EUR 500.

⁴⁵ Directive 2005/60/EC of the European Parliament and of the Council of 26 October 2005 on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing, OJ L 309, now repealed by the E-Money Directive.

⁴⁶ See, for the origin of the limitation, E-Money Directive, art 19(2).

⁴⁷ Tipik Communication Agency SA, 'Conformity Assessment of Directive 2009/110/EC Estonia' (Final Report Version 2.0, 8 February 2013) <https://ec.europa.eu/info/file/69755/download_en?token=6RBYX0bl> accessed 10 February 2020.

⁴⁸ With amendments transposing Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No. 1093/2010, and repealing Directive 2007/64/EC, OJ L 337.

It has appeared by now that these limitations may be disproportionate as until today not a single e-money institution license has been issued in Estonia.⁴⁹

This shows that a considerable hindrance existed on e-money institutions for 7 years, without any basis in the relevant EU law and without a challenge from entrepreneurs or courts.

The following section investigates the compliance of the said limitation with the principle of technology neutrality.

V. WAS THE LIMITATION IN SECTION 6(5) OF THE PIEIA TECHNOLOGY NEUTRAL?

The dichotomy between regulating performance and regulating design is the cornerstone of the principle of technology neutrality. “*Technology neutrality’s lodestar is intent to regulate behaviour, not technology; to worry about what occurs, not how it occurs.*”⁵⁰ The e-money definition attempts to regulate performance because the conditions listed are not limited to one technology, but rather, to behaviour, i.e., it regulates the issuance of stored monetary value, its use and acceptance.

However, by applying Reed’s classification of technology neutral regulation to Section 6(5) of the PIEIA, we find that this clause introducing a monetary limit for e-money devices was neither technology indifferent, implementation neutral nor potentially neutral.

Section 6(5) did not fulfil the criteria of *technology indifference*. The small monetary limits were set only for e-money devices, i.e., the Section targeted online forms of money, specific to e-money institutions. In contrast, payment accounts of payment institutions did not have any monetary limits, and even money remittance, which did not require a payment account, was not subject to monetary limitations per user.

Implementation neutrality was also not followed by Section 6(5). Reed argues that “*(the choice) to regulate the issuance of e-money, rather than the provision of e-payment services, was one of the reasons why this legislation*

⁴⁹ Ministry of Finance of the Republic of Estonia, *Opinion of the Ministry of Finance on the Bill on Amendments to the Payment Institutions and Electronic Money Institutions Act and Related Acts 498 SE* (nr 1.1-10/991-1, 11 October 2017) <<https://www.riigikogu.ee/download/a9de2a31-3261-41b0-8626-c390d38014f3>> accessed 10 February 2020 (in Estonian).

⁵⁰ Brad A Greenberg, ‘Rethinking Technology Neutrality’ (2015) 100 *Minnesota Law Review* 1495.

(e-Money Directive) was not implementation neutral.” Following the same line of argumentation, only e-money devices face monetary limits due to a norm that specifically regulates e-money devices instead of regulating a wider category of e-payment wallets.

Potential neutrality was equally affected by Section 6(5) because the monetary limits were a restrictive requirement that did not have an identifiable purpose. Technologies would be unable to adapt to the monetary limits when there was a competing regime for payment institutions that did not have similar limiting requirements.

The limitation also fails to comply with van der Haar’s *non-discrimination rationale* – that regulation must not favour one technology over the other, as otherwise, discriminatory rules would distort competition and the market. The simple fact of using fiat currency online (since CUBERs represented the money deposited in the bank account) caused the limitation to apply. Further, van der Haar’s rationale of *sustainability* requires regulation to be flexible and open to technological change. One may conclude that the limitation was flexible as it recognised rechargeable and non-rechargeable devices. However, the limitation failed to satisfy the sustainability rationale as it was static and non-responsive to changing market conditions. Further, Estonia’s Ministry of Finance itself recognised that the limitation was disproportionate and consequently, inflexible to technological innovation.

Lastly, Section 6(5) fails the rationale of the natural persons’ perspective, called the *denominated consumer certainty* rationale. As per this, when services are considered by consumers as interchangeable, technology neutrality would require that those services be regulated in a similar manner. The usage of funds on one’s account through a mobile application built on Bitcoin blockchain is certainly interchangeable, from a consumers’ perspective, with the usage of an Internet banking application through a centralised banking system, and consequently, these services should be regulated in a similar fashion.

VI. CONCLUSION

In this article, we have taken up a case study of the CUBER application and have applied the principle of technology neutrality to a specific section of the PIEIA and its implementation on CUBER. In analysing the CUBER model, we conclude that CUBER should not have been considered as e-money under the E-Money Directive and the PIEIA, as it served no purpose other than payment in fiat currency, and that therefore, it should not have been

subjected to more restrictive limitations, merely due to a difference in the infrastructure used in the cycle of payment.

Even assuming that CUBER did qualify as e-money, the LHV start-up would not require a license from the FSA as it offered an application for using CUBERs in payment for goods and services and was not the issuer of CUBERs. LHV, being a licensed credit institution, would also be exempt from the requirement of an e-money license as per Section 6(7)(3) of the PIEIA.

Finally, we conclude that Section 6(5) of the PIEIA was either erroneously transposed into national law or cautiously implemented in a very restrictive manner, which was non-compliant with the principle of technology neutrality. A monetary limitation on e-money devices, as opposed to no similar limitation on funds in bank accounts, discriminates against the medium and creates a substantial and unjustified imbalance between the e-money institutions regime and the credit institutions regime.