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Philosophical views on the procedure for regulating the norms of Blockchain technologies in the context of future prospects for the development of the meta-universe

Kiril Iliev

Doctor of International Law and International Relations, Assistant Professor of Department "Management of Telecommunications", University of Telecommunications and Posts, Blagoevgrad Bulgaria, <https://orcid.org/0000-0002-8128-3887>

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Abstract: This article explores the Blockchain technology role in the creation and functioning of the meta-universe. This concept reflects a new approach to data exchange and transaction execution that combines decentralisation, security, and immutability through Blockchain technology and smart contracts. The article analyses the theoretical basis for the functioning of the metaverse, including its philosophical foundations and moral and ethical aspects. Various organisational forms and features of the metaverse infrastructure are considered, as well as its interaction with Blockchain technology. The study is based on a comprehensive analysis of scientific literature, legislative and regulatory acts, as well as the use of specific tools, including data visualisation and analysis methods. The findings emphasise the importance of Blockchain technology in creating the metaverse and its various applications. They demonstrate the metaverse potential in ensuring decentralisation, security, transparency, and speed of data exchange and transaction execution. The research is of great theoretical importance as it expands our understanding of the meta-universe and the role of Blockchain technology in its functioning. The practical significance lies in the fact that the conclusions and recommendations of the study can be used to develop the development of new approaches to data exchange and transaction execution.

The significance of the findings is that the meta-universe can become the basis for the development of new approaches to data exchange and transaction execution, ensuring greater transparency, efficiency, and reliability of processes. This could have a significant impact on politics,

economy, and society as a whole. The use of the metaverse can foster innovative solutions, improve trust between parties, and reduce losses in the data exchange process. Thus, this article emphasises the importance of studying and applying the metaverse concept in the field of data exchange and contractual fulfilment. The results of the study confirm the potential of the metaverse as a tool for creating decentralised, secure, and efficient data exchange systems. Further research in this area can contribute to the development of new technologies and paradigms in the field of data exchange, which is of great importance for the development of society and its transformation into a more transparent, efficient, and fair system.

Keywords: ethical norm, moral norm, social norm, cryptocurrency, crypto market.

Introduction

Since the birth of Blockchain technologies, there has been a need to study the philosophical basis that defines the basis for regulating the norms that determine the basic socio-economic foundations of this tool. Given the rapid economic development and widespread Blockchain use in various spheres of life, there is a need to understand its future prospects. An analysis of philosophical views on the procedure for regulating norms in Blockchain technologies in the context of the metaverse can contribute to the creation of fundamental principles and ethical standards for the further development of this new area of economic activity of society.

Clarification of the moral and ethical aspects of norms regulation in Blockchain technologies is important in terms of forming an understanding of the metaverse - a concept that unites the real and virtual worlds, allowing feeling and comprehending their interaction. The study of philosophical views on Blockchain technologies can help to create a harmonious and effective interaction between these two spaces.

Given the lack of research concerning this topic, the relevance of studying philosophical views on the procedure for regulating the norms of Blockchain technologies in the context of future prospects for the development of the meta-universe becomes clear. Currently, there is a limited amount of research on this particular topic, and its understanding is still insufficient. Clarifying the moral and ethical norms will allow realising the deep philosophical perspectives of these technologies. The understanding their essence and potential will help to better understand the impact of Blockchain on everyday life in society.

The growing complexity and impact of Blockchain on various areas of life, including finance, medicine, logistics, and others, puts privacy, security, and justice at risk. Therefore, the study of philosophical views on the regulation of norms becomes extremely important in the context of the future development of the meta-universe. Thus, the relevance of this scientific article lies in the need to disclose the philosophical aspects of regulating the norms of Blockchain technologies in the context of the future development of the meta-universe. The study of this issue will contribute to the formation of fundamental principles and ethical standards that will meet the requirements of this new space.

Given the widespread use of Blockchain technologies and their interaction with the real world, understanding the philosophical views on the regulation of norms becomes the key to ensure the harmonious development of society in the future. Further study of this topic will allow understanding the impact of philosophical concepts on creating an effective and ethical environment for interaction between the real and virtual worlds.

Research Problem

The main problem of this study was that there are significant gaps in understanding the philosophical foundations of regulating social norms in the context of Blockchain technologies.

Insufficient attention was paid to the study of the ethical basis of these technologies, which made it impossible to create a harmonious and secure environment for their development. The lack of scientific research in this area has led to the absence of fundamental principles and ethical standards that would have a decisive impact on the use of Blockchain technologies in the future. This problem not only limited the understanding of the relationship between philosophy and the regulation of social norms but also made it difficult to create a metaverse - a space where the real and the virtual coexist. The lack of a clear understanding of this issue hindered effective communication and interaction between these two worlds.

Research Focus

This study focuses on the search for new philosophical visions that would emphasise the significance of existing views in determining an effective order of regulation of social norms in the context of Blockchain technologies. Considering future prospects for the development of the meta-universe, the study aims understanding the impact of existing concepts on the creation of an ethical and fair environment for the use of these technologies.

Also, the focus of the study was expanded to consider the impact of the sociocultural context on the formation of Blockchain technologies norms and regulation in the meta-universe. By analysing the role of values, moral beliefs, and cultural influences, the study found that views on how norms should be regulated may differ depending on the context in which they are used.

As a result, this study has not only uncovered non-trivial connections between philosophical views and norm regulation in Blockchain technologies but also contributed to the development of recommendations and principles that take into account the diversity of approaches and potential challenges, ensuring the effective and ethical functioning of the meta-universe in the future.

Research Aim and Research Questions

The main goal was to identify non-trivial connections between philosophical views and Blockchain technologies regulation, as well as to identify potential challenges and opportunities arising in the context of creating a new technological meta-universe. At the same time, the study emphasised the problem of balance between innovations brought by Blockchain technologies and the protection of the rights and freedoms of users of the metaverse.

Based on the objective, the following research questions can be identified:

1. Defining the philosophical foundations of Blockchain regulation.
2. Establishing the relationship between philosophical views and ethical aspects of using Blockchain technologies.
3. Analysis of the sociocultural context and its impact on the formation of Blockchain norms and regulation technologies.

Literature Review/Theoretical Overview

The review of scientific sources revealed a study conducted by Li (2021) that examines potential risks and regulatory measures for the development of the pass-through economy in the meta-universe. This article focuses on identifying possible threats associated with the use of Blockchain technologies in the meta-universe and proposes measures to regulate them.

In addition, a similar work was analysed by Narin (2021), who conducted a content analysis of scientific papers that addressed the issue of the existence of a virtual environment alongside the real one. This paper explores various aspects of the metaverse, its opportunities, and challenges. By analysing various scientific sources, the author identifies key topics and trends in the study of this phenomenon.

Nanobashvili (2021) analysed possible copyright challenges in the case of metaverse construction. The study focuses on evaluating the legal aspects related to intellectual property in the context of the coexistence of the virtual and real worlds. The author highlights possible difficulties arising from the use of materials whose authorship may be questionable or unclear in the virtual space.

The attention was also focused on the study by Nabben (2021), who examined the peculiarities of creating a meta-universe and the competition between “crypto-states” and corporations, including infrastructure. The author investigates various aspects, such as technological equipment, legal status, and the role of different actors in the formation of the meta-universe. The study focuses on the importance of competition and cooperation between different actors in the creation of the metaverse.

The paper by Swan and De Filippi (2017) offers an introduction to the symposium, which discusses the philosophical approach to Blockchain. The authors emphasise the importance of understanding the philosophical aspects of this technology and call for further research in this area. Hardjono, Lipton, and Pentland (2018) examine the philosophy of creating interoperable Blockchain systems. The study is aimed at developing principles and concepts that allow different Blockchain systems to effectively cooperate and interact with each other. The article by Dos Santos (2017) focuses on the analysis of the philosophy and functioning of Bitcoin/Blockchain technology. The study highlights the chaotic and complex aspects of this technology and places it in the context of philosophical views. These research papers contribute to the development of a philosophical understanding of Blockchain technologies, influence conceptual thinking, and pave the way for further research in this area. They make a valuable contribution to the understanding of the philosophical aspects of Blockchain and contribute to expanding our understanding of the possibilities of this technology.

This review analyses the article by Bailey, Rettler, and Warmke (2021), which explores the philosophical, political, and economic aspects of cryptocurrencies, focusing on a monetary system that exists outside the influence of the state. The authors examine the relationship between cryptocurrencies and politics, philosophy, and economics, investigating their implications and the possibility of understanding the cryptocurrency system without reference to state control.

Also, attention was focused on the work of Reijers and Coeckelbergh (2018), which explores Blockchain as a narrative technology. The authors analyse the social ontology and normative configurations of cryptocurrencies, highlighting the impact of these technologies on society and ethics. The study emphasises the role of Blockchain as a narrative-shaping technology and considers its impact on the formation of norms and values in the cryptocurrency environment.

The article by Wang, Duan, and Zhu (2018), which explores the security criteria for hash functions in the Blockchain, was considered. The study examines important aspects of security in the context of hash functions and their application in Blockchain technologies. The authors examine the criteria that determine the reliability and robustness of encryption algorithms and provide practical recommendations for ensuring security in the Blockchain.

Also, attention was focused on the chapter “Blockchain and tourism” in Treiblmaier (2020). The author examines the potential of Blockchain technologies in the tourism industry. The study highlights the possibilities of Blockchain the efficiency and security of tourism processes improvement, as well as

draws attention to potential challenges and obstacles that may arise when implementing this technology.

Additionally, the article by Clohessy, Acton, and Rogers (2019) was studied. It explores the adoption of Blockchain technologies from technological, organisational, and environmental perspectives. The study focuses on understanding the impact of Blockchain on technological innovation, organisational structures, and environmental sustainability. The authors provide insights into the factors that influence the successful implementation of Blockchain and point out important aspects to consider when adopting this technology.

Research Methodology

General Background

By applying interdisciplinary methods, the author analysed the organisational forms and infrastructure of the meta-space, which brought a new level to the study, actualising its prospects and significance. The study was carried out using modern comparative historical and source methods, analysis of scientific literature, legislative and regulatory acts. Specific tools, such as spatial and temporal correspondences, were used in order to achieve the integrity and completeness of the information. The use of applied methods of digital humanities, such as the content analysis and visualisation of research results, ensured the visibility and representativeness of the obtained data.

The basis of the research was an analysis of sources, including periodicals and organisations of various types, which included a comparison of their relevant indicators (quality, quantity, etc.) in the synchronic and diachronic planes. The scientometric analysis of articles in the mentioned periodicals (journals, scientific collections, almanacs, and conference proceedings) was conducted, and the results were visualised for clarity. In the course of the study, the results were summarised, and conclusions were drawn.

The scientific research consisted of several stages: the first stage was the research sources analysis (scientific literature, regulatory framework) and the formulation of the purpose and objectives of the scientific work. The second stage included a philosophical analysis of the state of functioning of Blockchain technologies in the context of the meta-universe. At the third stage, the research results were summarised, where the author formulated his own vision of the prospects for the development of Blockchain technologies.

Research Results

The obtained results lead to important conclusions that shed light on the problem of regulating Blockchain technologies in the context of future prospects for the development of the meta-universe. It is worth noting that these results were obtained through a comprehensive approach and the use of innovative methods. Starting with the analysis of the scientific base, an in-depth study of literature, periodicals, etc. related to the chosen topic was conducted. It provided valuable insights into the trends and development of the field, as well as identified gaps and prospects for further research (Allen, Lane & Poblet, 2019). The use of modern comparative methods allowed for a comparative analysis between different countries and contexts, which contributed to understanding different approaches and solutions in different contexts. It was found that there are general trends in the development of the field, but each country has its own specific features and approaches (Boring & Kim, 2018). After analysing the organisational forms and features of the metaspace infrastructure, conflicts in theory and practice were identified. Researchers and scientific schools had different approaches to defining and organising metaspace, which led to conflicts at the theoretical level. However, based on the analysis of practical

examples, the most effective approaches and recommendations for further implementation of the development of organisational forms and infrastructure of the metaspaces were identified (Barnett & Treleaven, 2018). The study identified gaps in certain aspects. For example, some studies were limited to the use of traditional methods that did not take into account the specifics of the metaspaces. There were also shortcomings in data collection and processing that affected the reliability of the results.

The philosophical foundations of the functioning of the metaverse, which exists thanks to Blockchain technologies, open up wide opportunities for reflection on the nature of reality, existence, and communication. This technology, particularly, makes it possible to create a distributed, secure and tamper-proof system that ensures the storage, transmission, and confirmation of information (Beck, Müller-Bloch, & King, 2018). On a philosophical level, the concept of a meta-universe built on Blockchain technology postulates the idea of a parallel digital reality that exists alongside our physical world. This reality can be viewed as a kind of “system of systems” where each data block is a separate element of this large mosaic. Thus, philosophical views on Blockchain offer a new interpretation of reality, which should be understood as a complex system of interacting elements. Table 1 provides an overview of the main characteristics of the meta-universe realised through Blockchain technology.

Table 1

Main features of the meta-universe

Feature	Description
Decentralisation	The meta-universe is based on the principle of decentralisation, where management and control are distributed among network participants.
Security	Thanks to Blockchain technology, the meta-universe has a high level of data security and immutability.
Transparency	All transactions and actions in the meta-universe are recorded on the Blockchain and are available for viewing by all network participants.
Immutability	Completed transactions cannot be modified or deleted, which ensures the integrity and reliability of the data.
Smart contracts	Metaverse supports the execution of automated smart contracts that allow the programmed execution of transactions and operations.
Speed	Blockchain technology allows transactions in the meta-universe to be conducted quickly and efficiently without intermediaries.
Scalability	The meta-universe has the potential to scale and process a large volume of transactions without losing performance.
Interoperability	The meta-universe provides the ability to interact and exchange data with other Blockchains and systems.

Source: author's own development

Given these features, the meta-universe has become an important tool for ensuring decentralisation, security, transparency, and consistency in data exchange and transaction execution. The use of smart contracts allows for the automation of processes and ensures the continuity and accuracy of transaction execution. In addition, the meta-universe provides speed and scalability, making

it effective for processing a large volume of transactions without delays or performance interruptions. From the point of view of researchers involved in the functioning of the Blockchain-based meta-universe, the emphasis is on the idea of decentralisation and democratisation. According to this approach, Blockchain becomes a tool that opens up opportunities for interaction and cooperation without intermediaries. This leads to an increase in the autonomy and self-organisation of the individual in a meta-universe where each person has the ability to control their data and their own identity (Minoli & Occhiogrosso, 2018; Ishmaev, 2017; Jalal, Shukur & Bakar, 2020).

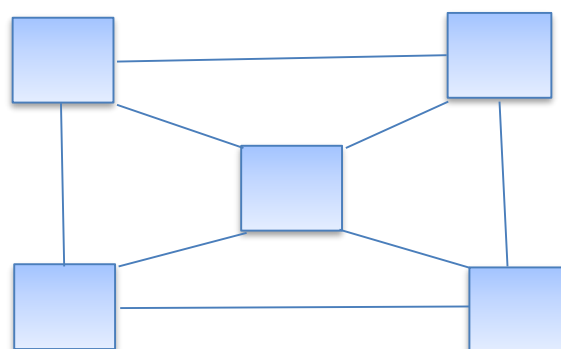
Another philosophical position that was evident in the process of studying the issue at hand is that in the functioning of the metaverse based on Blockchain technology, there is a problem of the truth and reliability of the information. Since this technology offers a decentralised system of data storage, where each transaction is confirmed by a large number of participants, it helps to increase the trust in the information in the meta-universe. Reflections on this topic can address the question of the objectivity of truth, the role of the community in determining truthful information, and the interaction between reality and the virtual world (Hyrynsalmi, Hyrynsalmi, & Kimppa, 2020; Elsdén, Gloerich, Spaa, Vines, & de Waal, 2019; Coeckelbergh, DuPont, & Reijers, 2018; Osivand, 2021).

At the same time, the philosophical understanding of the Blockchain-based meta-universe may call into question traditional concepts of ownership and control. The open nature of crypto technologies allows for the creation of smart contracts and decentralised applications that can replace traditional institutions and intermediaries in performing various functions. This raises philosophical questions about the nature of ownership, control, and power, as well as the distribution of resources and responsibilities in the meta-universe (Nalbant & Uyanik, 2021; Binson, 2021).

It is worth noting that the issue of the functioning of cryptocurrencies, particularly those based on Blockchain technology, was important for this study. The basic principle of this technology is shown in Figure 1. It has its own moral and ethical aspects that should be considered from a philosophical perspective. One of the key issues for this study is the ethics of finance and resource allocation (Dhami, Giudici & Martinazzi, 2018).

Figure 1

The basic principle of Blockchain organisation



Source: author (s) own development

First of all, cryptocurrencies provide an opportunity for direct financial transactions between individuals without the intermediation of banks or financial institutions. This can open up access to financial services to those who were previously excluded or limited in their access. However, it also raises moral questions about resource allocation and inequality (Treiblmaier et. al, 2021).

The decentralised nature of smart contracts also challenges traditional moral concepts related to the control and regulation of financial systems. The lack of centralised control means that there is no central authority that can prohibit or restrict certain transactions. This can give rise to moral dilemmas when the use of cryptocurrencies becomes uncontrolled and can be used for illegal activities such as money laundering or terrorist financing (Broadhead, 2018).

In addition, the use of virtual money raises questions about privacy and confidentiality. In some cases, although transactions may be anonymous, information about them may still be available on the Blockchain. This may risk the privacy and security of personal data and may also have moral implications in the context of abuse and criminal activity. For example, cryptocurrencies can be used for illegal transactions, terrorist financing, money laundering, and tax avoidance. These aspects call into question the ethical use and development of cryptocurrencies (Dupont, 2017).

The task of moral and ethical analysis of cryptocurrencies is to identify and address these ethical issues. It is important developing behaviour ethical standards and norms for users, exchanges, payment systems, and other participants in the cryptocurrency space. It is also necessary to facilitate cooperation between regulators, technology companies, and other stakeholders to create effective mechanisms for controlling and regulating the cryptocurrency market.

Particular attention should be paid to the principles of transparency, responsibility, and reasonable use of resources. Companies and participants in the cryptocurrency market must adhere to ethical standards in the storage and protection of the personal data of their users, as well as in the conduct of financial transactions. It is important developing mechanisms to detect and prevent financial fraud and harmful practices (Castellacci & Tveito, 2018).

The moral and ethical aspect of cryptocurrency mining should also be taken into account. Mining is the process by which new blocks are added to the Blockchain and participants who perform computational tasks are rewarded in cryptocurrency. However, it requires significant computing resources and electricity, which can have a high environmental burden and raise issues of sustainability and ecological balance (Van der Merwe, 2021).

In this context, moral dilemmas arise when deciding whether the use of significant computing resources and electricity for cryptocurrency mining is justified. This may risk the preservation of ecological balance and necessitate more efficient use of resources in mining operations (Duan et al., 2021).

It should also be noted that moral issues also arise due to the changing financial system and power relations. Cryptocurrencies can affect traditional financial structures and economic systems, which can cause conflicts and uncertainties. Questions about regulation, power, and control can have a significant moral dimension as they relate to fairness, equity, and access to financial services (Ning et al., 2021).

All these findings emphasise the need for further research on the organisational forms and infrastructure of the metaspaces. It is important engaging in an interdisciplinary approach and using innovative methods in order to obtain more accurate and complete results. It is also necessary paying attention to eliminating conflicts in theory and practice and promoting the exchange of research knowledge and experience between countries.

Discussion

One of the most important issues of the study was the ethical responsibility of cryptocurrency market participants and their actions, as it affects the credibility of this technology and its future development. First of all, it is worth raising the issue of confidentiality and privacy. The use of

cryptocurrencies draws attention to the safety of users' personal data. Although transactions are anonymous, information about them may be available on the Blockchain. This risks the privacy and security of personal data, which can have negative consequences. However, it should be noted that cryptocurrency developers can improve protocols ensuring greater privacy and protection of users' personal data (Valeri & Baggio, 2021).

The misuse of cryptocurrencies can lead to the financing of illegal activities, terrorism, money laundering, and tax evasion. This fact causes serious resentment and concern in society, violating its ethical norms. To solve these problems, it is necessary to involve regulators in order to develop effective mechanisms for controlling and regulating the cryptocurrency market. Such measures may include establishing rules and standards of behaviour for market participants, limiting the use of cryptocurrencies in illegal transactions, and ensuring cooperation between law enforcement agencies and cryptocurrency platforms to detect and stop illegal activities (Klems et al., 2017).

In addition, there is the issue of the social responsibility of cryptocurrency market participants. Given the high volatility and the possibility of making large profits, market participants must act with awareness of the consequences of their actions and an understanding of ethical boundaries. For example, market manipulation, speculation, and unfair schemes can harm other market participants and undermine fairness. Therefore, it is important to strive for transparency, fairness, and ethical behaviour to ensure stability and trust in the cryptocurrency market (Manogaran, Alazab, Shakeel & Hsu, 2021).

It is also important mentioning the economic side of cryptocurrencies. The decentralised nature of the Blockchain and the mining process of cryptocurrencies, particularly Bitcoin, require a large amount of computing resources and electricity. This can lead to significant energy consumption and carbon emissions, which is contrary to environmental principles. In order to ensure the moral and ethical functioning of cryptocurrencies, it is necessary to find ways of mining process optimisation, to use environmentally friendly energy sources, and promote the development of energy-efficient alternatives (Toyoda, Machi, Ohtake & Zhang, 2020).

In general, the moral and ethical aspect of cryptocurrencies is complex and requires the attention of all market participants. This can be achieved through the development and implementation of ethical norms and standards that take into account important aspects such as privacy protection, anti-abuse and financial manipulation, social responsibility, and environmental sustainability (Rahardja, Hidayanto, Lutfiani, Febiani & Aini, 2021).

To begin with, it is important to establish ethical principles and norms that must be observed by all participants in the cryptocurrency market. This may include a ban on market manipulation, fraud, and the illegal use of cryptocurrencies for terrorist financing or other illegal activities. It is important that market participants have access to information about the risks and possible consequences of their actions, as well as understand how their actions may affect other participants and society as a whole (Kozlowski, 2018).

To ensure the social responsibility of cryptocurrency market participants, self-regulation and mutual control mechanisms can be introduced. For example, the creation of professional associations or organisations aimed at promoting ethical standards and establishing ethical rules of conduct for their members. Such organisations can educate, support, and monitor market participants to ensure that ethical standards are met (Seok, Park & Park, 2019).

This study is of great theoretical and practical importance in the context of the development of cryptocurrencies and their functioning in the modern world. From a theoretical point of view, the study highlights the ethical aspects of cryptocurrencies and the problems associated with their functioning. It

contributes to the understanding of ethical principles that should be taken into account in the development and use of cryptocurrencies and helps establishing ethical norms and standards for market participants. It provides a scientific basis for the development of ethical policies governing the cryptocurrency sphere and helps to raise awareness of the ethical aspects of cryptocurrencies among professionals, regulators, and the public. On the practical side, the study provides recommendations and suggestions for addressing ethical issues related to cryptocurrencies. It contributes to the development of self-regulation and control mechanisms that ensure compliance with ethical standards in the field of cryptocurrencies. The study also emphasises the importance of social responsibility and the sustainable development of cryptocurrency market participants. Taking ethical principles into account can help improving the trust in cryptocurrencies, create a more sustainable and efficient system of financial transactions, and ensure fairer conditions for all market participants.

Conclusions and Implications

To summarise, this paper analyses the moral and ethical aspects of cryptocurrencies and their impact on society. The study has shown that cryptocurrencies open up new opportunities, but also raise important ethical issues that require careful consideration and development of appropriate ethical principles and norms. The main findings of the study include:

- ✚ Cryptocurrencies pose new ethical challenges related to privacy, security, and personal data protection. It is necessary to ensure the efficiency and moral acceptability of their operation by developing appropriate ethical principles.
- ✚ The use of cryptocurrencies can have an important social impact by facilitating broad access to financial services and reducing transaction costs. However, there are risks, such as financial instability and abuse, which require careful regulation.
- ✚ Effective management of the moral and ethical aspects of the cryptocurrency environment requires cooperation between market participants, government, and regulators. The development of ethical standards and regulations, as well as raising education and awareness about the ethical issues of cryptocurrencies, are important steps in this direction.

Given the growing popularity of cryptocurrencies and their impact on society, it is important to research and analyse their moral and ethical aspects. The following research should be aimed at solving the dilemmas created by the creation of the cryptocurrency meta-universe.

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