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Introducing *Maqāsidic* Framework for Central Bank Digital Currency (CBDC)

Mohd Noor bin Omar*
mnoor@ikim.gov.my

Abstract
Money is a social convention performing its functions to facilitate the socio-economic ecosystem. For decades, money has evolved from barter, rare piece, metal, fiat and presently a distributed blockchain-based digital money. Monetary authorities around the world are expected to advance their own national Central Bank Digital Currency (CBDC) that works effectively and efficiently. Several studies have investigated the technical, economic and feasibility of CBDC that might have an impact on monetary policy and liquidity. This study employs the *maqāsid al-sharī'ah* framework to investigate an ethical dimension of CBDC and lay out an Islamic principal guideline. The findings introduce an ethical ecosystem useful to signify the viability type of CBDC with specific characteristics and features. This is also possible in modelling the compliance aspects of digital monetary system to the Islamic monetary framework.

* Fellow at the Centre for the Study of Shariah, Law and Politics, Institute of Islamic Understanding Malaysia (IKIM).

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Keywords
Digital currency, central bank, *maqāṣid al-sharīʿah*, monetary system.

Introduction

Money is an integral part of socio-economic ecosystem. A central bank is accorded the authority to manage a country's monetary policies to ensure economic growth, financial stability, and settlement. The progression of technology innovates the forms of money from metal to fiat, and currently into a digital form. Digital money, be it representing fiat-based currency or cryptographic digital token, is meant to facilitate the functions of money as a medium of exchange, a store of value and a unit of measurement. The interest in cryptocurrency is further intensified by the growing distrust in fiat money which is predicated on a lending/debt base, whereas digital currency is asset or security based.[1] Moreover, cryptographic and blockchain-based digital token issued by an anonymous private body enables peer-to-peer exchange in prevaricating traditional central clearinghouses. This represents not only a threat to the central bank or monetary authority, but also its potential to disrupt the whole financial system as well as challenge the traditional business model. In addition, this poses a challenge for the role of a central bank in maintaining stability, efficiency, and confidence in the financial ecosystem. Monetary authorities are exploring the possibility of digital currency to supersede both existing fiat-based money and privately issued distributed block chain-based digital money. The rapid evolution of the digital currency and its associated mechanism creates a financial landscape for the people, government and monetary authorities to review, rethink and reform the digital financial system. Thus, central banks around the world are considering

1. Sheila Ainon Yussof and Abdullah Al-Harthy, "Cryptocurrency as an Alternative Currency in Malaysia : Issues and Challenges," *Islam and Civilisational Renewal* 9, no. 1 (2018): 48–65, https://doi.org/10.12816/0049515.

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a self-governing central bank digital currency (CBDC). It is a new kind of digital money that could reform all aspects of the financial system and, at the same time, fulfil the function of money effectively and efficiently. While several studies have investigated the technical, economic and feasibility of CBDC, this article intends to focus on its ethical aspect. Ultimately, the monetary authorities must ensure that all aspects of CBDC are compliant, not only to the regulatory, economic stability and growth, but also the *shari'ah* injunctions. The Islamic financial system with the Islamic guiding principles has the potential to become one of the best practises of social and ethical finance.

The objective of this article is to observe the fundamental principles of Islamic ethics in the application of CBDC by employing the *maqāṣid al-sharī'ah* framework. It is important to ensure that the innovation of CBDC be aligned with the higher objective of the *sharī'ah* as a way of fulfilling the requirement of Islam and ensuring benefits and justice to all humankind. The conventional practice of finance has been argued to lack Islamic injunctions due to alleged practices of implied Islamic prohibition such as opening a backdoor to *riba*.[2] The initiative to analyse CBDC based on *maqāṣid al-sharī'ah* framework is to identify potential *mafsadah* (mischief), particularly on the issue pertaining to the principles of jurisprudence, and ethics. In doing so, this article will omit selected technological possibilities and focus only on the characteristics and features of CBDC. In addition, this article will open up the opportunity to revisit and realise the concept of money from an Islamic perspective.

Money from the Islamic perspective

Islam recognises money as a medium of exchange and a unit of measurement. Imam al-Ghazālī rejects money as a store of value by comparing it to a ruler who cannot be imprisoned, otherwise it will deprive society of its benefits and those who

2. Imran Ismail, "Legal Stratagems (Hiyal) and Usury in Islamic Commercial Law" (Phd. diss., University of Birmingham, 2010).

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hoard *dirham*s and *dinar*s will be considered as transgressors.[3] Money was invented to fulfil socio-economic needs. Advancement in business dealings has forced money to evolve from its original basic item and kind to a sophisticated contemporary application such as the digital token. Throughout history until today, money has never ceased to transform significantly from barter, rare items, metal, paper and recently, in digital form.

Money should not be an objective in itself, but rather a means to realise certain proceeds as it has no intrinsic utility.[4] Money also cannot be considered as a commodity to enable trade because it is simply a temporary intermediary and instrument for transactions. If profit-making is the motive of exchange, money should be integrated into a capital by legal obligation in a sales contract, for instance, to enable it to be interchanged with a commodity or asset.[5]

The Rise of Cryptocurrencies

Online transactions using digital platforms have the prospective to become widely accepted for payments and settlements. Such a trend has caused rather grave concern in recent years. During the COVID-19 pandemic, digital currencies are perceived to be useful for online settlements and many providers have been in the race of offering digital banking and wallet. In Malaysia, the online fiat-based money transaction operates on Real Time Electronics Transfer of Funds and Securities (RENTAS). The purpose of RENTAS is to enable overall efficiency of payment system-Interbank Funds Transfer System (IFTS) and Scripless Securities Transfer System (SSTS). Bank Negara Malaysia is collaborating with the Hong Kong Monetary Authority

3. Abdul Azim Islahi, "An Analytical Study of Al-Ghazali's Thought on Money and Interest," in *The International Conference on Al-Gazali's Legacy: Its Contemporary Relevance* (Kuala Lumpur: International Institute of Islamic Thought and Civilization, 2001).
4. Muhammad Taqi Usmani, "Post-Crisis Reforms: Some Points to Ponder,"
5. Iraj Toutounchian, "Integrating Money in Capital Theory: A Legal Perspective (Islamic Finance)," … *for Islamic Economics and the Islamic* …, 2006, 75–113.

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for Payment versus Payments (PvP) infrastructure of settling interbank ringgit-US dollar trade launched the Renminbi (RMB) settlements to support cross-border payments and settlements, the onshore multi-currency funds.

Thus, a reconsideration of prevailing monetary system to encompass digital currency equipped with vigorous security qualities is the solution. Monetary authorities have been responsive in addressing the importance of legislation for the digital money's connections, closely observing evolutions in digital currencies and assessing their propositions for the economy, the financial system and central banks. The monetary authority in the digital monetary system plays a significant role in classifying and deliberating any potential risks posed by digital currencies and provides possible regulatory responses. Such a set of regulatory standards could also set out frameworks for cross-country collaboration and organisation in areas such as information sharing and the exploration and tribunal of cross-border transgressions.

The innovation of cryptocurrency is considered to be a financial disruption to the conventional monetary system. Cryptocurrency comes as part and parcel of the financial technology (fintech) revolution and digital wave. Cryptocurrency is virtual or digital in nature, takes the form of tokens or coins and is almost entirely intangible. The word crypto simply refers to the complicated cryptography that allows for the creation and processing of digital tokens or coins across decentralised systems. Cryptocurrencies are designed to be free from government intervention and contro. It is a type of unregulated digital money which is issued and controlled by its developers and being used and accepted among members of a specific virtual community. It is also a form of digital currency that uses cryptographic algorithms to ensure digital money supply as well as virtual security and control platforms.[6]

6. O. S. Bolotaeva, A. A. Stepanova, and S. S. Alekseeva, "The Legal Nature of Cryptocurrency," *IOP Conference Series: Earth and Environmental Science* 272, no. 3 (2019).

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The growth of effective regulatory reactions to the digital currency is still in its primary phase. Digital currency is hard to be regulated as it cuts across the responsibilities of multiple agencies at both the national or international levels. Many are operating privately and beyond the jurisdiction of the conventional system. The digital monetary system poses a dilemma to the monetary authority of a country which is whether to let it be on full control of distributed ledger or with full control by private entity and without governance by monetary authority. If it is not tied to a country's authority interventions, manipulation by an anonymous autonomy is at stake. The legitimacy of the digital currency considerably varies from country to country. A few countries, such as Japan, have expressly permitted their utilisation and exchange, while others, for instance, the People's Republic of China have prohibited or regulated cryptocurrencies. In the case of Malaysia, a guideline has been issued under the Digital Currency (Sector 6) of Anti-Money Laundering, Counter Financing of Terrorism-AML/CFT as an initial response.[7] The issues which concern economists, scholars and jurists are the question of sovereignty, compatibility and compliance to the national security and financial domain. The digital currency would need to convince users, stakeholders and countries of its value while offering better and more convenient payment solutions. The rise of digital transaction and the decline in cash payments are among the motives for the introduction of a new genus of money.

Central Bank Digital Currency

The Central Bank Digital Currency (CBDC) is a digital form of currency that is backed by a central bank and has legal tender recognition by law as a means to settle debts or meet financial

7. Bank Negara Malaysia (BNM), "Anti-Money Laundering and Counter Financing of Terrorism (AML/CFT) – Digital Currencies (Sector 6)," no. Sector 6 (2018).

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obligations such as tax payments, while at the same time, the central bank would have direct excess to apply its monetary policy.

The cryptographic digital currency is a unit of asset or security which is privately issued in the form of a digital unit on the Distributed Ledger Technology (DLT) platform.[8] It is purely issued from a block of a particular recorded data chain. The digital token or asset of cryptocurrency coin is, however, not a currency. In fact, it is a record of unit holder ownership right encrypted in digital cryptographic data. It is transferable in a transaction as a medium of exchange[9] and secure to be transferred via online transaction using the blockchain technology engaging peer-to-peer cloud networking with public and private key.[10] Blockchain is a digital ledger system of transaction recording information in a way to make it chained with each block of information that is impossible to be manipulated, hacked or changed. Bitcoin (BTC), for example, was the first successful cryptocurrency ever existed and invented based on a published whitepaper by Satoshi Nakamoto entitled "Bitcoin: A Peer-to-peer Electronic Cash System". Primarily, the unique characteristic of Bitcoin is that it is a decentralised cryptocurrency, peer-to-peer direct transfer, secure and on distributed network as an intermediary for verification and proof of stake.[11] Gradually, the BTC digital token gains a recognition

8. Richard Adams et al., "The Future of Money and Further Applications of the Blockchain Proposal," *Strategic Change* 26, no. 5 (September 1, 2017): 417–22, https://doi.org/10.1002/jsc.2141.
9. Nashirah Abu Bakar, Sofian Rosbi, and Kiyotaka Uzaki, "Cryptocurrency Framework Diagnostics from Islamic Finance Perspective: A New Insight of Bitcoin System Transaction," *International Journal of Management Science and Business Administration* 4, no. 1 (2017): 19–28, https://doi.org/10.18775/ijmsba.1849-5664-5419.2014.41.1003.
10. Ahmed Kosba et al., "Hawk: The Blockchain Model of Cryptography and Privacy-Preserving Smart Contracts," *Proceedings - 2016 IEEE Symposium on Security and Privacy*, SP 2016, 2016, 839–58, https://doi.org/10.1109/SP.2016.55.
11. Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System," *Www.Bitcoin.Org*, 2008, 9, https://doi.org/10.1007/s10838-008-9062-0.

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forming the market capitalisation of USD886.27 billion.[12] There are approximately 11,879 cryptocurrencies and digital tokens with market capitalisation of more than US$2.12 trillion in existence, differing in name, structure, and features.[13]

There are multiple cryptocurrency platforms available in the market. Proof of Work (PoW) makes use of the concept of the same name to process transactions in a blockchain, i.e., a distributed ledger system on network shared among every participating computer (called nodes). On the other hand, Proof of Stake (PoS) is a smaller pool of nodes to validate transactions that PoW could not do. Any nodes that try to cheat automatically forfeit their stake as a penalty. Another platform offering is the token. Tokens are distinct from the traditional blockchain stand-alone systems. Finally, stablecoins is a cryptocurrency created for the sole purpose of providing reliable value digital storage. Stablecoins represents something of a hybrid (either backed by multiple or single commodity, fiat or crypto) between tokens and standard cryptocurrencies or collateralised such as Thether (USDT), True USD (TUSD), Paxos Standard (PAX), and Binance USD (BUSD). They are built on existing blockchain but may be exchanged for fiat currency. It is the most reliable cryptocurrency for CBDC to peg on. Be it on any platform, the cryptocurrency is a secure digital system that can transmit value.

12. Data from CoinMarketCap, the world's most-referenced price-tracking website for cryptoassets in the rapidly growing cryptocurrency space. Accessed on 15 September 2021. www.coinmarketcap.com.
13. Ibid.

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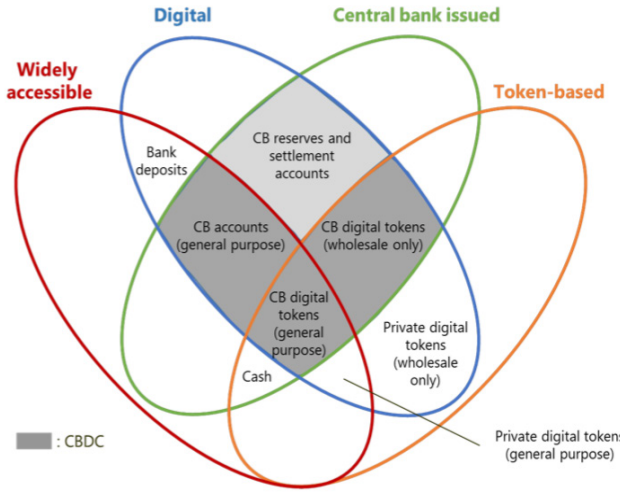

Table 1: The Venn-diagram on Taxonomy of Money (Source: World Economic Forum 2019)[14]

In summary, the Bank of International Settlements (BIS) has developed a taxonomy of money in Table 1, to classify money: Issuer (central bank or other), form (electronic or physical), accessibility (universal or limited) and transfer mechanism (centralised or peer-to-peer), while blockchain technology creates a new outlook to efficiency, resiliency and security for digital token. Many studies have been conducted on matters relating to blockchain and digital currencies. The research on blockchain applications within the Islamic monetary system is specifically on the potential of digital currency as a better alternative to fiat and paper monetary system.[15]

14. Ashley (World Economic Forum) Lannquist, "Central Banks and Distributed Ledger Technology: How Are Central Banks Exploring Blockchain Today?," *World Economic Forum*, 2019.
15. Ibrahim Bassam Zubaidi and Adam Abdullah, "Developing a Digital Currency from an Islamic Perspective: Case of Blockchain Technology," *International Business Research* 10, no. 11 (September 29, 2017): 79, https://doi.org/10.5539/ibr.v10n11p79.

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The blockchain-based digital currency is expanding in place of the current fiat-based system, thus, disrupting the existing monetary system and structure. The growth of its market capitalisation has increased tremendously since its inception and has alarmed the monetary authority, such as the central bank, to devise regulatory mechanisms. In the World Economic Forum 2019, a special focus was given to the research, experimentation and early implementations of CBDC with various use cases of distributed ledger technology and a groundwork for the introduction of CBDC.[16] One key issue for such monetary authorities as the central bank is whether or not to release its own digital currency that can be used by the general public to make payments. Fung and Halaburda suggest an outline to evaluate why a central bank should consider supplying a digital currency and how to implement it to improve the efficiency of the retail payment system.[17] Indeed, many papers which have been published to that effect have proposed variable types and platforms in offering CBDC in line with the aspiration. To date, monetary authorities of countries such as China, Senegal, Singapore, Tunisia, Estonia, Japan, Russia, Sweden and Palestine are testing the issuance and uses of CBDC.

According to a paper published by the Committee on Payments and Market Infrastructures, Bank for International Settlements (BIS), CBDC could replace fiat-based currency and function as a medium of exchange, a store of value, and a unit of account for internal and international operations.[18] Among the central banks that took the project into the pipeline are the Bank of England, Central Bank of Sweden, Uruguay, Singapore (project name UBIN), India, Canada (Jasper), Russia (Oleg Fomichev), Switzerland (e-Swiss Franc), Marshall Island, China, Estonia, Iran, Canada, USA, and Venezuela (Petro). In

16. Lannquist, "Central Banks and Distributed Ledger Technology: How Are Central Banks Exploring Blockchain Today?"
17. Ben S. C. Fung and Hanna Halaburda, "Central Bank Digital Currencies: A Framework for Assessing Why and How," *SSRN Electronic Journal*, no. 22 (2016): 1–27, https://doi.org/10.13140/RG.2.2.26985.70243.
18. CPMI, "Central Bank Digital Currencies," 2018.

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fact, following that, a working paper published by the staff of Bank of England has proposed three models of CBDC that have the potentials to be implemented.[19]

Efforts put in by the Atlantic Council shows the real time CBDC Tracker updating developments to date are shown in Table 2. The monetary authorities of countries such as China, Senegal, Singapore, Tunisia, Estonia, Japan, Russia, Sweden and Palestine are testing the issuance and uses of CBDC.

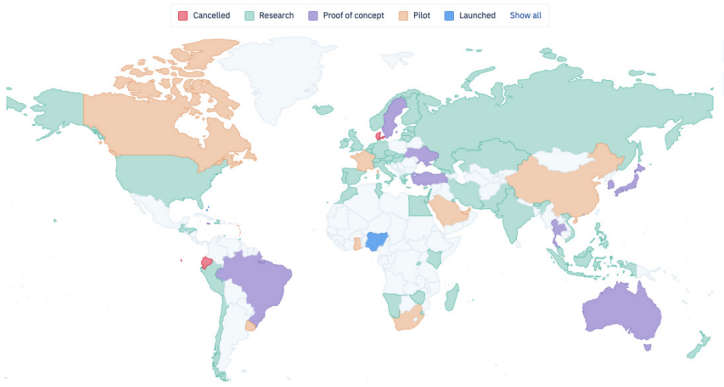

Table 2: CBDC Tracker on the World Map
(Source: Atlantic Council January 2022)[20]

Islamic View on the Digital Currency

The aim of the Shariah can be summed up as in the following, "the obtainment of benefits (*maslahah*) and the avoidance of harms (*mafsadah*)".[21] In the financial realisation, the Shariah

19. Michael Kumhof and Clare Noone, "Central Bank Digital Currencies — Design Principles and Balance Sheet Implications," 2018.
20. Figure from the Atlantic Council-a nonpartisan organisation to shape solutions to global challenges. Accessed on January 16, 2022. www.cbdctracker.org.
21. Ahmad Al-Raysuni, *Imam Al-Shatibi's Theory of the Hihger Objectives and Intents of Islamic Law*, *The International Institute of Islamic Thought* 22 (2013) https://doi.org/10.1007/s13398-014-0173-7.2.

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seeks to dispense with all types of monetary improprieties, poverty, unemployment, and underemployment among people and monetary accessibility for the public to achieve prosperous living. It is to safeguard and prevent any type of deception, misrepresentation and injustice in financial dealings.

The Shariah supports real economic activity and mutual agreement in trade so as to empower a person to gain a living appropriately, and it takes expansive measures to guarantee the smooth running of business exchanges in commerce. The Shariah has allowed every genuine mechanism and procedures that are required for development and enhanced success to individuals. Any abusive activities that can obstruct humans to thrive are unlawful. For example, interest (*ribā*) and gambling, both endorse some financial dues at the expense of individuals. [22] Monetary advancement with respect to law and fair procedures in managing financial and asset is essential for the improvement of human life is basically connected to the *maqāsid*. The goals (*maqāsid*) of the Islamic monetary application are as follows: a) financial prosperity within the framework of the ethical standards; b) fraternity and equity inclusion; c) just and fair; and d) flexibility, equality and social welfare.[23] The objectives of the Islamic monetary framework are equity and value; arrangement of the financial needs of the people or financial wellbeing; improvement of the people's monetary assets or financial development; and change in the social milieu of the community.

Given its vital association with all the Islamic sciences, the concept of *maqāṣid al-sharī'ah* has turned into an authentic structure for creating theories, models, approaches and plans of change in different parts of life. Financial improvement particularly Islamic finance has likewise gotten some *maqāsid*-based intercessions as of late, a standout amongst the most

22. Asifa Quraishi and Mohammad Hashim Kamali, "Principles of Islamic Jurisprudence," *Journal of Law and Religion* 15, no. 1/2 (2000): 385.
23. Fazlur Rahman Faridi, "Theory of Fiscal Policy in an Islamic State," Journal of King Abdulaziz University: *Islamic Economics* 1, no. 1 (1983): 15–30.

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imperative of this being Chapra's (2008) work. Two essential inquiries should be tended to with respect to the implications of the *maqāṣid* on CBDC issues: first, what part can *maqāṣid* play a role in understanding financial issues, breaking down financial marvels and figuring financial strategies?; and second, what significance does the concept of *maqāṣid* have in the investigation of financial advancement from the Islamic point of view?

There are different motivations to uphold that the *maqāṣid al-sharīʿah* are vital to all financial examination, as they identify with the subject of deprivation, possessions transference and monetary improvement. As observed, in every one of the discourses concerning the *maqāṣid al-sharīʿah*, researchers, scholars and jurists, from the time of al-Juwaini (476 AH) and followed by al-Ghazali (d.505 AH), had been consistent in upholding that safeguarding and distribution of possessions as among the major goals of the Shariah.

Ultimately, the real Islamic banking and finance is an institution that is unable to sell money for money with interest as the price. CBDC is totally new and the digital financial ecosystem could be the answer to the above conundrum. Crafting a new digital system for the central bank with new governing policies and instrument fulfils the Islamic teaching.

Conceptual Application

The principles of the *maqasid al-shariah* could be applied on the CBDC and digital financial ecosystem on every stage from introduction, implementation and implication. In other words, evaluation based on the *maqasid al-shariah* is to be made on the foundation, theory, structure and application of CBDC. The first stage of evaluation on the *maqāsidic* framework is by tracing the existence of the following ethical elements of shariah in the digital currency bank:

1. Protect public interest;
2. Protect seigniorage of ownership and right to earn income;

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3. Security consideration and payment system;
4. Financial stability and eliminating speculative activities;
5. Policy governance and instrument implementation;
6. Technological and service efficiency; and,
7. Equal wealth distribution and financial inclusion.

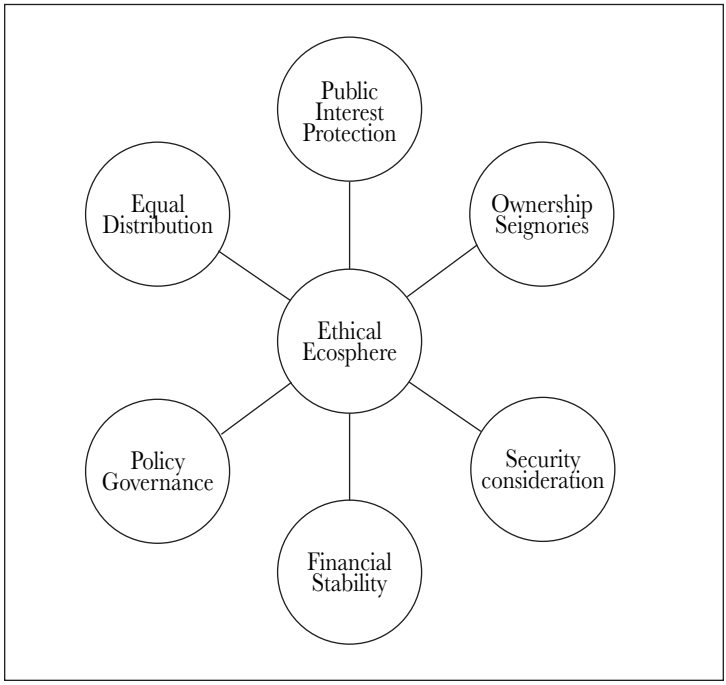

Table 3: Ethical Elements of *Maqasid Al-Shariah* Framework
(Source: Author's illustration)

Having the indicators will help us to investigate how CBDC plays its role in the ethical perspective in the new era of digital economy. The existence of those *maqasidic* elements in the CBDC would serve as indicators on the Shariah-compliant ethical ecosphere dimension of CBDC. The *maqasidic* elements should be consistently present throughout the whole processes

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of CBDC, rather than in one or two certain processes only. As the process of developing the digital currency is still in progress, the findings of the elements are juxtaposed with every type of digital currency such as crypto-based, fiat-based, be it blockchain or stablecoin as the CBDC.

Ethical Eco-sphere	Introduction	Implementation	Implication	RAM Decision*
Protecting public interest	Y/N	Y/N	Y/N	Y/N
Ownership Seignories	Y/N	Y/N	Y/N	Y/N
Policy govern-ance	Y/N	Y/N	Y/N	Y/N
Financial stability	Y/N	Y/N	Y/N	Y/N
Technological efficiency	Y/N	Y/N	Y/N	Y/N
Equal wealth distribution	Y/N	Y/N	Y/N	Y/N
Maqasidic Framework Decision	%	%	%	Y/N

Table 4: Ethical Ecosphere Checklist of CBDC
*RAM =Rational Actor Model
(Source: Author's illustration)

Conclusion

The introduction of CBDC will change the role of central bank money, the scope of direct access to central bank accountabilities, and the construction of financial intermediation. There are various forms and design choices for digital currency that carry

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diverse inferences for policy transmission, payment systems, and the new digital financial ecosystem. Our findings have pointed to the ethical aspect of digital currency solely based on the intent and intensity of the Shariah. The structured framework, that is, the ethical elements cover all important aspects of the *maqāṣid al-sharīʿah* such as justice, equal rights concerning people, institutional, technological, administrative, and legal aspects. All of these need to put in the proper theoretical and practical framework. It is hoped that the achievement of the foundation of the ethical ecosystem will support an effective and efficient digital monetary ecosystem.

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