A BLOCKCHAIN RESEARCH REVIEW

ⓘ **Mohammad Tariq Hasan¹⁺**
ⓘ **Mahadi Hasan Miraz²**
ⓘ **Farhana Rahman Sumi³**
ⓘ **Shumi Sarkar⁴**

¹Assistant Professor, School of Business and Economics, United International University (UIU), Bangladesh.
¹Email: tariq2060@gmail.com Tel: +8801755577344
²Assistant Principle, Inasis YAB and Muamalat, Universiti Utara Malaysia (UUM), Malaysia.
²Email: mahadimiraz1@gmail.com Tel: +60147958289
³,⁴Assistant Professor, Department of Business Studies, University of Information Technology and Sciences (UITS), Bangladesh.
³Email: farhana.abrar@gmail.com Tel: +8801947741903
⁴Email: sarkar.shumi@gmail.com Tel: +8801611080468

(+ Corresponding author)

ABSTRACT

Blockchain technology was first introduced as Bitcoin's underlying technology which is one type of distributed ledger that consists of replicated, shared, and synchronized data over the Internet. This study extends prior studies on blockchain. A fundamental framework for a blockchain research classification was proposed by analyzing 230 articles related to the study of blockchain published in Asia and around the world from 2016 to 2020. The study applies a comprehensive meta-analysis based on findings, literature sources, research objectives, research methods, and context. The objective of the study is to summarize the current blockchain research, its constraints, and future trends. Meta-analysis is characterized by the process of theory construction. It is a powerful tool to analyze the literature in a descriptive form which will guide for further study. Research shows that the study at home is more decentralized, non-systematic, and has failed to gain a certain research depth—Moreover, it lacks quantitative analysis. Future research will focus on digital currency, Internet financing, and the risk of blockchain technology research.

Contribution/Originality: This study contributes to the existing literature by examining the previous studies in the period of 2016-20 which help us to comprehend the scope of study on blockchain.

1. INTRODUCTION

The blockchain was first published in Satoshi Nakamoto's 2008 article "Bitcoin: A Peer-to-Peer Electronic Cash System" (Nakamoto, 2008). He proposes an electronic currency: Bitcoin, based on the P2P (Miraz, Hasan, & Sharif, 2019a; Miraz, Hasan, & Sharif, 2020a) system design's decentralized structure to solve a trust problem (Luther, 2016). Further study of the blockchain diversifies its application. In January 2015, the "Bretton Woods System 2015 White Paper" was published at the Bitcoin conference in Miami, USA (Cao, Cao, Wang, & Lu, 2017). The three phases were proposed for blockchain development: the Blockchain 1.0 phase, an encrypted digital currency (Miraz, Hasan, & Sharif, 2019b; Miraz, Hasan, Sumi, Sarkar, & Majumder, 2020b). It is reflected mainly in the Bitcoin application: blockchain 2.0 stage, smart deal (Gatteschi, Lamberti, Demartini, Pranteda, & Santamaría, 2018). Blockchain is used on financial or economic markets (Miraz et al., 2019a; Miraz et al., 2020a) and extends into inventories, bonds, futures, loans, mortgages, ownership rights, IPP, and other agreements (Chu & Gao, 2019).

Blockchain 3.0 phase, a very innovative step of the application (Maesa & Mori, 2020). It is widely used in certain public services worldwide (Hou, 2017). All walks of life are very interested in blockchain development and think its prospects are excellent (Cao et al., 2017). The academic community believes that blockchain does involve the financial industry and subverts the entire society's operation (Cao et al., 2017). Regulators are more concerned that blockchain will change and have an impact on economy (Shanaev, Sharma, Ghimire, & Shuraeva, 2020).

Moreover, the blockchain redefines human life and has a high value for research (Lu, 2019). The British government published an essential report on blockchain technology in December 2020 (Ali, Ally, & Dwivedi, 2020). In the story called "Distributed Book Technology: Beyond the blockchain," the federal government in Great Britain explores the distributed account technology similar to blockchain technology and examines blockchain's potential in the traditional financial sector (Lu, 2019). In addition, few researchers also analyze the potential of blockchain (Miraz et al., 2020a; Miraz et al., 2020b; Miraz, Hasan, Sumi, Sarkar, & Majumder, 2020c). The People's Bank of Asia set up a digital money technical team as early as 2014 and held a unique digital currency seminar in December 2020. During this seminar, they examined how blockchain technology can produce virtual currency to improve financial activities' efficiency, convenience, and transparency (Böhme, Christin, Edelman, & Moore, 2015). And at the beginning of 2020, a billion US dollars were invested in the capital market to accelerate chain development (Chishti & Barberis, 2016). This trend shows that the paper synthesizes blockchain classifications for domestic and academic papers globally (Alzahrani & Daim, 2019; Aste, 2019; Miraz & Ali, 2018; Miraz et al., 2019a; Miraz et al., 2019b; Nawang & Azmi, 2020; Pandya, Mittapalli, Gulla, & Landau, 2019; Sarwar, Nisar, & Khan, 2019; Schaupp & Festa, 2018; Şcheau, Crăciunescu, Brici, & Achim, 2020; Sovbetov, 2018; Xiong & Tang, 2020; Yang, 2016; Zulhuda & Sayuti, 2017), then proposes a blockchain classification framework and describes blockchain characteristics (Lu, 2018). This paper's importance is that, by summarizing the blockchain study, it helps us to comprehend the present research situation and clarify the work that needs to be further improved to promote blockchain research in Asia (Abou Maroun, Daniel, Zowghi, & Talaei-Khoei, 2018; Al-Amin, Sharkar, Kaiser, & Biswas, 2021; Maesa & Mori, 2020; Miraz & Ali, 2018; Miraz et al., 2019b; Miraz 2020; Miraz et al., 2020d; Perera, Nanayakkara, Rodrigo, Senaratne, & Weinand, 2020; Yang, 2016).

2. THE BLOCKCHAIN CONCEPTS AND FEATURES

The blockchain technique is superior to centralized data storage because it is decentralized (Zhang & Chen, 2019). Blockchain does provide an element of opportunity for economic and political change (Malherbe, Montalban, Bédu, & Granier, 2019). Both the nodes checked the details of the block together (Lu, Huang, Azimi, & Guo, 2019). The features (Nathan, Govindarajan, Saraf, Sethi, & Jayachandran, 2019) of the blockchain are:

1. The system does not rely on centralized administration or hardware organizations (Latif, Idrees, Ahmad, Zheng, & Zou, 2021; Lee, Azamfar, & Singh, 2019; Li et al., 2021; Lin, Shen, Zhang, & Chai, 2018).

2. Taking away faith. Data sharing is not required among the device nodes. Therefore, such a node cannot deceive all other nodes.

3. Time management. Each node in a cluster secures the database.

4. Impurities. Editing a single node does not affect all nodes in the network, and those edits cannot be used to change the information and data stored.

5. Tracing. The block includes information that can be correlated and traceable back to the front of the blocks per data.

6. Anonymity Privacy. The confidence and privacy aspects can be lost when the details about the interaction between the nodes is publicly revealed.

3. RESEARCH AND ANALYSIS OF LITERATURES

In order to examine the current literature on the blockchain, we have used "blockchain" as a keyword in google scholar, academia, emailed search engine, Elsevier search engine, etc. Finally, 230 items of literature have been selected for the study based on the following criteria:

1. The selected article from January 2016 to December 2020.
2. Literature related to a blockchain.
3. Focused on published articles.

3.1. Analysis of Literature Sources

Our current journal classification is based on society's existing library classification system. As for the social sciences in Asia, there are as many as 230 journals that will be sorted—according to the Scientific Citation Database, organized into two groups. Total Social Science publications include finance, social science, business administration, technology, and economics. It is feasible that publications will cross several categories. Table 1 shows that there are many aspects of the research that are focused on blockchain technologies. There is a positive trend in academic research on blockchain technology, fascinating more scholars to investigate other areas of knowledge.

Table-1. Literature sources.

Journal Classification	Classification Subtotal	Proportion
Economics	123	53.4%
Management	37	16%
Technology	54	23.4%
Comprehensive social science journals	7	3%
Comprehensive university journals	9	4%
Total	230	100%

3.2. Analysis of Literature Research Subjects

The 230 literature chosen would be broken into nine sections. The sections are finance, Fintech, ICT, accounting, credit, big data, Internet energy, the current status, threats, and others. Banking and finance is categorized into seven sectors as "digital currencies", "payment", "bills", "banks", "internet banking", "supply chains" and "big financial market". The figures are illustrated in Table 2.

Table-2. Analysis and types of manuscripts.

No.	Research Subjects	Qualitative	Quantitative	Percentage
1	Finance	39	17	24.35%
2	Fintech	29	14	18.70%
3	ICT	20	14	14.79%
4	Accounting	9	15	10.44%
5	Credit	8	9	7.40%
6	Big Data	5	6	4.80%
7	Energy Internet	8	5	5.66%
8	The status quo, future and risks	8	11	8.27%
9	Others	5	8	5.46%
	Total	131	99	100 %

Blockchain has the most studies in finance, with about 68 (39+29) publications by the end of year 2020. Seven sub-topics describe the topic:

3.2.1. Finance

Fifty-six articles consider blockchain the underlying protocol, comprising 24.35% of all the papers. Few researchers provided the three basic concept assumptions for digital currencies; the Central Bank Accounts Model, the retention of the current financial system, and commercial banks issue the common currency (Rugeviciute & Mehrpouya, 2019; Shanaev et al., 2020; Sulaiman & Rahim, 2019). Blockchain technology is a technological breakthrough for addressing the issue of trust. Blockchain financial technologies will minimize settlement processes and costs of businesses. Through this, banks will have access to all rewards and threats from the distributed blockchain book (Wong, Tan, Lee, Ooi, & Sohal, 2020). It has a significant impact on financial intermediation because banks used these new technologies. It affects the economy, money, central banking, economic structure, and settlement of payments (Asaduzzaman, Hasib, & Hafiz, 2020; Aste, Tasca, & Di Matteo, 2017; Ayedh, Echchabi, Battour, & Omar, 2020). Peer-to-peer transfers, authentication, exact property, and intelligent administration are the platform's main components. Blockchain technology is an alternative to Internet payment networks (Abou Maroun et al., 2018; Al-Amin et al., 2021; Ali, Ali, Alsaawy, Khalid, & Musa, 2019; Ali et al., 2020; Miraz et al., 2020e). It has a significant role in credit decision-making. This research shows that the link block modified the new financial credit system entirely and reduced financial risk and fraud risk. Another researcher studied the impact of blockchain on smart contracts and for small enterprise credit. Supply chain financing services are mainly provided to small-sized enterprises (Kim & Laskowski, 2018; Ku-Mahamud, Omar, Bakar, & Muraina, 2019; Miraz 2020; Wong et al., 2020). Also, it will provide a variety of financing products to the investors that small and medium-sized businesses need. The banker would not have the opportunity to bring financial resources because there is no core credit security for businesses (Bashir, 2018; Beck, Stenum Czepluch, Lollike, & Malone, 2016; Berg, Novak, Potts, & Thomas, 2018; Biswas & Gupta, 2019). Now, blockchain technology lets information input into the data base have the guarantee of time-stamp and unalterable nature. Also, chain block articles have analyzed the impact of chain block on a financial domain (Bronder, 2018; Cao et al., 2017; Carson, Romanelli, Walsh, & Zhumaev, 2018). First, blockchain was introduced to economic infrastructures. It was then generalized to the settlement processes of shares and cash systems, the central depository of stocks, and the lending institutions.

3.2.2. Fintech

Blockchain is mainly used in the Fintech research field (Fosso Wamba, Kala Kamdjoug, Epie Bawack, & Keogh, 2020; Miraz & Ali, 2018). It took the most research attention for research (Rugeviciute & Mehrpouya, 2019; Sulaiman & Rahim, 2019). From the Fintech ground, the researcher collected forty-three articles, and the ratio was 18.70%.

3.2.3. ICT

Blockchain opened a new paradigm in the ICT sector (Ku-Mahamud et al., 2019; Miraz & Habib, 2016; Miraz et al., 2019a; Miraz 2020; Miraz et al., 2020a; Miraz et al., 2020b; Miraz, Mohd Sharif, Hassan, & Hasan, 2020f; Morkunas, Paschen, & Boon, 2019; Wong et al., 2020). In the field of ICT, the research analyzed thirty-four articles with 14.79%.

3.2.4. Accounting

Almost all of the literature in Asia deals with accountancy. Another academic explained that the blockchain would help to improve audit performance and lower the costs associated with auditing. Besides, individual businesses have started designing self-audit programs to liberate manual accounting work and bring about a fundamental shift in the corporate model. Some have simultaneously started developing auditing software.

3.2.5. Credit

There are 7.4% of total study engaged in credit issues. Someone else called attention to the researcher's insistence that credit is vital in allocating economic and social capital allocation. It is difficult to ascertain whether large amounts of knowledge may be accurate or not blockchain lowers global borrowing costs, thus providing a credit infrastructure. Another researcher suggested using digital credit to bypass behaviors that make transactions impossible to reverse.

3.2.6. Big Data

Big data documents 4.8% of the literary study. Because of the Big Data, Far predicted that everyone would be able to take responsibility for their own data while gaining data access to reduced prices.

3.2.7. Energy Internet

Artificial intelligence accounts for 5.66% of Internet blockchain. In three words: The energy internet consists of three parts: power generation, delivery, and storage. This researcher points out that electricity, money, and power transmission, and capital are a better fit for blockchain technology's distributed book structure. Nonetheless, some issues persist, such as inefficiency and storage redundancy.

3.2.8. The Status Quo, Future, and Risks

Blockchain architecture literature, upcoming issues, and vulnerabilities represent 8.27% of the risk landscape. The researcher discusses the financial services applications, public institutions, the media, healthcare, elections, domain names, and many other fields and draws attention to the significant consequences of blockchain for privacy and alternative business models.

3.2.9. Other

This paper includes 5.46% literary works and canons and cannot be put into either of the above groups. He also addressed three possible military use applications for blockchain technology: intelligence operations, handling arms life cycles, and logistics. They have also summarized the challenges posed in the area of military-specific blockchain technology: To incentivize users to contribute to a community, another researcher proposed using the Cat Claw Coins to create a blockchain ecosystem to teach the users.

3.3. Analysis of Literature Research Methods

Several different testing methods exist, the majority of which come from quantitative and qualitative perspectives, including classification, study and literature interpretation (Saunders, Lewis, & Thornhill, 2003; Saunders, Lewis, & Thornhill, 2009; Scheurich, 1997). The methods and techniques used in quantitative research include methods and techniques for measuring social phenomena, the intensity of social relationships, and shifts in the amount (Sekaran & Bougie, 2016; Taherdoost, 2016; Urbach & Ahlemann, 2010). The theory is confirmed by a combination of statistical investigation, expert analysis, reliable statistics, and experimental methods (Sekaran & Bougie, 2016; Taherdoost, 2016; Urbach & Ahlemann, 2010; Weijters & Baumgartner, 2012; Wong et al., 2020; Yusof et al., 2018; Zikmund, Babin, Carr, & Griffin, 1991). Figure 1 described the scenario of previous literature on blockchain where 57% study used qualitative method and rest 43% used quantitative method. The primary methodology of qualitative forecasting is done by forecasters' experience and on the assessment of events based on their viewpoints and trajectories. The procedure is more useful for those who don't have complete data.

Figure-1. Literature methods.

The qualitative research's primary means of gauging findings from Table 2 reveals that it can be considerably better than the quantitative approaches used in Table 2 (100%). People concentrate on the qualitative aspects of study due to developing the blockchain in Asia, inhibiting the latter's growth. We advocate the use of blockchain technologies to advance to the quantitative findings also, as soon as possible in this case.

3.4. Research Limitation

Since Asian blockchain analysis has not been systematized, finding papers on it is a challenge. In future studies, the fidelity of the reference citations should be increased. As a result, the scarcity of English-language resources, this paper only deals with a few topics. This study does not make a comparison of Asia and Western studies.

4. CONCLUSION

Based on our assessment of blockchain's viability, market potential, and competition, we arrive at the following conclusions: In the year of 2020, the number of academic research papers related to the blockchain increased by an exponential factor. The media's interest in domestic scholars has increased lately because of digital money growth. Significant amounts of trade are conducted in both Bitcoins and Lehman dollars. Also, the financial periodicals found in libraries come from Economics and Technological courses. There is a distinct difference between technical papers and publications. These are mostly concerned with the concept of blockchain and magazines that are primarily about its application in business. Creative idea: Fintech seems to have an absolute edge over 187 articles (accounting for 63.4% of the search results) that cover topics like digital currencies, banks, and finances as a whole. The last category of the journal also revolves around the research's current subject. Many organizations worldwide are devoting their efforts to understanding and exploring how blockchain technology can lower their financial burden and expenses. Domestic researchers can then strive to increase their study's quantity to fulfill their role in influencing policy. Asian and foreign researchers should concentrate further in the future on the decentralized blockchain theory.

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