

---

## Introduction

---

### Sam Goundar

School of Computing and Information Sciences,  
The University of the South Pacific,  
Laucala Campus, Suva, Fiji  
Email: sam.goundar@gmail.com

---

Blockchains and cryptocurrencies are now topics of substantial impact that academia, practitioners and the IT industry need to contemplate, study, research, publish, innovate, exploit and adopt. The *International Journal of Blockchains and Cryptocurrencies (IJBC)* aims to be the premier resource for the most innovative scholarly and professional research information pertaining to the management, organisation and technological use of blockchains and cryptocurrencies. Research articles in this issue and future issues will be essential for anyone interested in these areas. The *IJBC* is the first journal dedicated to these topics.

The editor-in-chief, associate editors and all editorial board members of the *IJBC* are proud to present the inaugural issue of the *IJBC*. We would like to thank all the reviewers that peer reviewed all the articles in this issue. We also would like to thank the admin and editorial support staff of Inderscience Publishers that have ably supported us in getting this issue to press and publication. And finally, we would like to humbly thank all the authors that submitted their research articles to this issue. Without your submission, your tireless efforts and contribution, we would not have this issue or even this journal.

Publication of an inaugural issue of any journal is not easy. Establishment of a new journal with a reputable publisher is even harder. The first step is to find a publisher that is willing to publish such a journal. Given the dynamics of academic publishing today, disruptive transformation of academic publishing by the internet, delivery and access of published research papers by PDF downloads, and Open Access academic journal models, many established publishers are now reluctant to start new journal. The *IJBC* is indeed honoured to be publishing under Inderscience Publishers – a publisher that is second to none. Disruptive technologies like blockchains and cryptocurrencies have been seen by many as a passing fad. The publication of this inaugural issue on blockchains and cryptocurrencies is proof that it is not a fad, but a mainstream disruptive technology.

For any new journal, it takes a lot of time and effort in getting the editorial board together. Everyone on the editorial board, including the editor-in-chief is a volunteer and holds an honorary position. No one is paid. Getting people with expertise and specialist knowledge to volunteer is difficult, especially when they have their full-time jobs. Our editorial board is still in development. Five associate editors out of six have been appointed. The intention was to ensure that the associate editors had international representation and were from each of the six continents. Next was selecting the right people with appropriate skills and specialist expertise in different areas of the blockchains and cryptocurrencies to be part of the editorial board. Even though, we are not at full strength, we have managed to publish our inaugural issue with five associate editors and 24 editorial board members under the current editor-in-chief.

Every journal and publisher has its own paper acceptance, review and publishing process. Inderscience uses an online editorial system for paper submission. Editorial assistants are the first to do a rigorous check on the paper before passing it through the system to the editor-in-chief. The editor-in-chief then does his own review and selects reviewers based on their area of expertise and the research topic of the article. After one round of peer review by more than three reviewers, a number of revisions and reviews an article is ready to be typeset and published.

The *IJBC* intends to publish original research papers, review papers, technical reports, case studies and book reviews in all its future issues. Special issues devoted to important topics like financial technologies, banking technologies, distributed ledger technologies, supply chain management, healthcare, forecasting, research, and e-voting, etc. will be occasionally published.

The primary objective of the *IJBC* is to be a primary forum for scholars, researchers and practitioners to disseminate knowledge, methodologies, theoretical analyses, modelling, simulation and empirical studies on blockchain technologies and cryptocurrencies. Publications on the evolving theory and practice related to distributed ledger technologies, peer-to-peer digital currencies, and other emerging blockchain technologies are intended to provide a comprehensive coverage and understanding of its use within the technological, business, management and organisational dimensions. The secondary objective of this journal is a thorough examination of blockchains and cryptocurrencies with respect to issues of management, organisation, technological, governance, trust, privacy, and interoperability.

Blockchain technologies are being claimed to be as disruptive as the internet. A white paper titled, *Bitcoin: A Peer-to-peer Electronic Cash System* appeared in 2008 written by a Satoshi Nakamoto (a pseudonym) that set everything into motion. The white paper detailed how an electronic cash transaction can take place between peers without the need for a third party (financial institution – FI). Since then, the paper has been cited 5,687 times at the time of writing this introduction. Digital signatures and cryptography would be used to secure the financial transaction, and peers on the Bitcoin network running on the blockchain technology (BT) would verify, validate and authorise the transaction to eliminate the ‘double spend problem’. According to Nakamoto (2008), this would make the system and transaction transparent, immutable and under the control of peers, thus eliminating control of a FI and their exorbitant fees. The Bitcoin network would timestamp transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain will not only serve as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. Messages are broadcast on a best effort basis, and nodes can leave and re-join the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

The website BlockGeeks (2019) defines blockchain as is a growing list of records, called *blocks*, which are linked using cryptography. Each block contains a cryptographic hash of the previous block a timestamp, and transaction data (generally represented as a Merkle tree). By design, a blockchain is resistant to modification of the data. It is “an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way.” Blockchains use with peer-to-peer electronic cash transactions enabled a number of financial technology (fintech) applications, distributed ledger technology (DLT) applications and introduction of more than thousand other Cryptocurrencies. Bitcoin still remains the most popular cryptocurrency.

Blockchains have now moved from electronic cash to other applications in government, supply chain management, healthcare, agriculture, real estate, international development, and almost any application that utilise databases can be replaced with a more secure, immutable, consensus-based, transparent and trust-based database. Apart from FINTECH applications, other applications based on blockchains are emerging in every sector and industry as everyone is intent on taking advantage of the special properties of blockchains mentioned in the earlier sentence.

Some examples of blockchain applications in use are:

- land ownership and management (Dubai and Georgian governments)
- development aid (South African early childhood development)
- supply chain management (Everledger)
- renewable energy (Trans Active Grid)
- remittances (Blockchain Wallet)
- digital identity (AID: tech – Syrian war refugees)
- agriculture (traceability, fair trade)
- democracy and governance (elections, voting)
- health (Modum.io)
- climate change (Power Ledger)
- environment (SOLshare)
- education (BitDegree)
- financial inclusion (MojaLoop)
- human rights (Stop the Traffik)
- water (Clean Water Coin).

Cryptocurrencies are ‘digital money’ that do not physically exist, but can be converted to any popular physical currency. Bitcoin, the first digital money was hatched as an act of defiance. Unleashed in the wake of the Great Recession, the cryptocurrency was touted by its early champions as an antidote to the inequities and corruption of the traditional financial system. Bitcoin sought to replace the services provided by FIs with cryptography and code. When you pay your mortgage, a series of agreements occur in the background between your FI and others, enabling money to go from your account to someone else’s. Bitcoin and other cryptocurrencies replace those background agreements and transactions with software – specifically, a distributed and secure database called a blockchain.

If you could piece together a running tabulation of who held every dollar, then suddenly the physical representations would become unnecessary. Bitcoin achieved the running tabulation by creating a single, universally accessible digital ledger, called a blockchain. Bitcoin’s blockchain, unlike the ledgers maintained by traditional FIs, is replicated on networked computers around the globe and is accessible to anyone with a computer and an internet connection. A class of participants on this network, called

miners, is responsible for detecting transaction requests from users, aggregating them, validating them, and adding them to the blockchain as new blocks. It's called a chain because changes can be made only by adding new information to the end. Each new addition, or block, contains a set of new transactions – a couple of thousand that reference previous transactions in the chain.

*CIO Insights Reflections: Cryptocurrencies and Blockchains – Their Importance in the Future* by Notling and Muller (2017) report the following:

“With the help of cryptography and a collective booking system called blockchain, cryptocurrencies build a distributed, safe and decentralized payment system, which does not need banks, intermediates, an organization or a central technical infrastructure to work. The main difference to the current types of money we know is that an intermediate, which is responsible for production (e.g., central bank) or exchange (banks) is not needed. Exchanges of digital values and goods are made directly between two individuals.”

Known cryptocurrencies are Bitcoin, Ethereum, Ripple, Litecoin and IOTA. In a sense they are scarce commodities as the amount of available currency units is in this case limited by mathematical algorithms. After every digital currency unit is issued there is no way to generate additional currency units from it (e.g., Bitcoin is limited to 21 million units). Furthermore every cryptocurrency has their own currency generating process. Main factors likely to affect the future development of cryptocurrencies are, in Notling and Muller (2017) opinions, interventions by the government and central banks and questions on how the sector will be regulated.

The articles in this inaugural issue are:

- 1 ‘Consensus protocols as a model of trust in blockchains’, by Auqib Lone and Roohie Naaz Mir

The first article by Lone and Mir looks at trust as the determinant of blockchains acceptance which is based on the consensus protocol. Blockchain is a decentralised, replicated, transparent and immutable data store. Blockchains are best described not as trustless, but on the basis of distributed trust: trusting everyone in aggregate. Consensus protocols are the heart and soul of the blockchains as they help in achieving this distributed trust. Blockchains are updated via the consensus protocols that guarantee their consistency and integrity over geographically distributed network nodes. Various algorithms can be applied to achieve a consensus based on the requirements like performance, security, scalability, consistency, and failure redundancy. Creating a global fair decentralised consensus protocol is of prime importance, in order to address above-mentioned requirements sufficiently. This paper focuses on analysing the already proposed consensus protocols adopted by popular blockchain platforms to determine their feasibility and efficiency. Parameters that are critical in evaluating blockchain consensus protocol are also discussed. This paper also analyses the hardness of achieving the fair decentralised trust with proof.

- 2 ‘Cryptocurrencies: the communication inside blockchain technology and the cross-border tax law’, by Andrea Romaoli Garcia and Pedro Henrique Romaoli Garcia

In the second article, the Garcia’s research aims to analyse the social event that is modifying the traditional financial system since the BT and cryptocurrencies came

up. Taxation in international scenario were examined by side the ideals from governments in a democratic system as an instrument that materialises human rights. The social observation approaches the legacy of Emile Durkheim philosophy who established a power relationship between social fact and coercion. The taxation has been the focal point in smart economy to juridical scientists and everyone involved in the digital economy. The researchers conducted tests and researches from historical and social method, seeking for laws, doctrine, jurisprudence and concrete case analysis in front of the philosophical school of logical-semantic constructivism.

- 3 'Mathematical assessment of blocks acceptance in blockchain using Markov model', by Riktsh Srivastava

The third article by Srivastava uses the Markov model to analyse how blocks of transaction are accepted and appraised using the queuing theory. Blockchain, introduced in Bitcoin system is disrupting the way transactions are done in businesses via charging small transaction fees. It is observed that the acceptance of blocks in the blockchain is based on transaction value. Transmittals through blockchain are favoured due to low transaction cost and grander security. However, attempt of implementing blockchain to revolutionise business processes writhes from problem of waiting time for blocks. In this paper, the transaction-confirmation-time is appraised using queuing theory, where the approval rate of blocks in blockchain is concocted using Markov queue model. Four specific use cases of 1, 3, 6 and 60 confirmations are considered for practical purposes.

- 4 'A quick synopsis of blockchain technology', by Veeramani Karthika and Suresh Jaganathan

A quick synopsis of BT is the fourth article by Karthika and Jaganathan. Blockchain evolved as a core technology of Bitcoin, and earned a significant attraction for entrepreneurs and researchers nowadays. The blockchain is an open, immutable distributed public ledger that allows transactions to take place in a decentralised manner without a need for a trusted third party. Bitcoin, the first successful cryptocurrency, is a peer-to-peer electronic payment system. The thought for Bitcoin started as a means for making a secure currency that had no centralised control. Blockchain application is not only restricted to Bitcoin, but it also ignited the idea of using it for a wide range of fields such as e-health, governance, arts, culture, education, electricity trading, etc. To apply this technology to many areas, one should have a complete understanding of what it is, this paper is meant to give a quick synopsis of BT.

- 5 'Digital ledger technology-based real estate transaction mechanism and its block size assessment', by Nikita Singh and Manu Vardhan

Singh and Vardhan writes about the use of DLT for real estate transactions in the fifth article. Use of blockchain technologies like distributed ledgers for land and property ownership is popular amongst many governments. DLT is set to transform the existing architectural models of FIs and government machineries. Although real estate transactions are a major source for the governments to earn revenue, these are plagued with the risk of fraudulent practices. The digital documents are vulnerable to the alteration or any other attacks or can be tampered and ownership of the

documents can be changed. The centralised storage involves single point of failure as well as network traffic overhead. The proposed distributed and decentralised blockchain-based architecture provides protection against any intrusive activity which is offset by the majority voting achieved in consensus mechanism for each transaction and verification request. The proposed work provides web interface for user queries and analysis of query search time is carried out.

- 6 ‘Optimised and dynamic KYC system based on blockchain technology’, by José Parra-Moyano, Tryggvi Thoroddsen and Omri Ross

The last article in this inaugural looks at how customer loyalty and intimacy can be maintained with the use of blockchain technologies. Systems that use BT to improve the know-your-customer (KYC) process have only been proposed at a conceptual level and all share certain attributes that make their adoption very difficult. We propose and program a blockchain-based system that reduces and shares out among the FIs that work with a customer the costs of the KYC process and also makes it possible for FIs to dynamically update information related to customers and disseminates this information among participating FIs. Additionally, our system addresses some of the attributes that hinder the adoption of previously proposed solutions by FIs. The result is a stand-alone solution that reduces the cost of the KYC process without requiring any central instance to store the customer’s data, and in which FIs share the initial costs of the KYC process as well as the running costs of keeping the information about customers up to date.

I hope everyone will enjoy reading the articles in this inaugural issue of the *IJBC*. Additionally, I feel that it will inspire and encourage readers to start their own research on blockchains and cryptocurrencies and submit their article to future issues of this journal.

Once again, I take this issue to congratulate everyone involved in the writing, review, editorial and publication of this inaugural issue.

## References

- BlockGeeks (2019) *What is Blockchain Technology? A Step-by-Step Guide for Beginners* [online] <https://blockgeeks.com/guides/what-is-blockchain-technology/> (accessed 19 May 2019).
- Nakamoto, S. (2008) *Bitcoin: A Peer-to-peer Electronic Cash System*.
- Notling, C. and Muller, M. (2017) *CIO Insights Reflections: Cryptocurrencies and Blockchains – Their Importance in the Future*, Deutsche Bank Wealth Management [online] [https://www.db.com/newsroom\\_news/cio\\_insights\\_reflections\\_-\\_cryptocurrencies\\_and\\_blockchains\\_-\\_EMEA\\_-\\_client\\_ready.pdf](https://www.db.com/newsroom_news/cio_insights_reflections_-_cryptocurrencies_and_blockchains_-_EMEA_-_client_ready.pdf).