

## Guest Editorial Preface

# Special Issue on Blockchain Technology and Applications

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Blockchain is a “buzzword” and highly claimed as an emerging technology in recent years. It is believed to be most promising technology in near future that will revolutionize that how the things work today. It is primarily based on decentralization and consensus policy. Blockchain-based systems have received significant attention in both academia and industry. Blockchain is basically derived by combining two words: block and chain – which is a continuously growing list of records, called blocks. These blocks are linked and secured using cryptography. It is also known as a distributed ledger that can record all transactions efficiently in a verifiable and permanent way.

The special issue on “Blockchain technology” has invited the findings and research work related to the application and challenges of blockchain for optimal, decentralized, distributed and secure systems. It is identified that present shape of blockchain is not fully matured and is keep evolving day by day. There is a need for its base architecture framework to be standardized. The key objective of this special issue is to provide an opportunity to all researchers, scholars, scientist working in the area of blockchain to share their results and outputs to the research fraternity in order to frame guidelines, build a roadmap for developing blockchain based applications. This special issue is believed to serve a great help as there are not many journals covering this area.

Blockchain Technology is the best amalgamation of core existing concepts and technologies for the development of information technology which influences various areas like healthcare, voting, identity management, land records and government etc. particularly in finance; it has been successfully applied to digital crypto currencies. This special issue has invited any research in the area of blockchain that clearly outline any real-world use cases using blockchain technology. Scope of journal covered all domains of blockchain.

This special issue on “Blockchain Technology and Applications” of the International Journal of e-Collaboration (IJeC) contains four manuscripts which are an excellent work in the area of blockchain technology. The accepted manuscripts presented a different perspective of solving any real world problem in blockchain context. The papers published in this issue explored various dimensions and provide directions for various approaches, principles, applications and the implementation of blockchain technology.

This special issue includes four papers which cover a range of aspects of distributed ledger technology, ranging from a rigorous survey to identify the implications of this technology; to improve supply chain management; to enhance features in cloud computing and to handle security issues. Each published manuscript has undergone full double-blind peer review, prior to being selected for this special issue. All submitted articles are thoroughly evaluated for novelty and quality.

First paper titled “Technologies In Health Care Domain: A Systematic Review” explores the possibility of improving the health care system using cloud computing through distributed

technology which is the fundamental idea behind blockchain technology. Authors demonstrated that blockchain can also help in the field of healthcare by providing non-manual medical record mining which would help in making more precise predictions and reduce medical errors by ensuring more accurate treatment, while simultaneously reducing the cost. Authors also emphasize the emergence of IoT which is very useful in Healthcare system these days. The IoT has the ability to provide a new turning point by facilitating communications with the entities or object nearby. The flexibility of cloud computing services is offering many possibilities for organizations that were never expected; among those are healthcare centers too. Though there are many advantages of IoT but many issues and challenges need to be tackled like scalability of the project, privacy and security of data. If these challenges get solved, the industries in the IoT applications, will give a numerous advantages and power in the industrial area.

Second paper titled “Permissioned Blockchain Model for End-to-End Trackability in Supply Chain Management” proposed a permissioned model of blockchain for supply chain trackability. Supply Chain is one of the most complex processes for any enterprise and is like a backbone for the business. For a global enterprise, the supply chain becomes increasingly complex due to a network of retailers, distributors, transporters, warehouses. This paper aimed at looking about how blockchain application in supply chain management can enhance efficiency, transparency and trust in the industry. From business perspective, blockchain can have different ways in how it can be implemented in supply chain. Factors like, type of product, types of actors and objective of the supply chain determine the design of blockchain. In other words, blockchains will be designed differently for different supply chains, for example, the blockchain design for food supply chain will be different from blockchain for manufacturing supply chain. Also, blockchains can be designed to product tracking, implement secure payment or audit of certifications, to name a few. The model proposed in this paper can be utilized to provide product tracking and certificate auditing. However, there needs to be more research into blockchain modules and libraries/contracts which can enable development even faster.

Third paper titled “Secure & Effective Key Management Using Secret Sharing Schemes in Cloud Computing” explores secret sharing schemes by which the data is partitioned into several shares and stored on different resource providers. Key management is one of the difficult parts of cryptography. Keys can be stolen or can get hacked by external or internal threats. The paper proposed a novel approach of threshold Secret~ sharing scheme using Newton divided difference Interpolating Polynomial. The proposed method is made secure by using dynamic threshold generation. A threshold value is calculated to retrieve the original data. In order to reconstruct the original secret, the number of data shares must be smaller than threshold value. The paper comprised of the introduction of cloud computing followed by types of secret sharing schemes and LaGrange interpolating polynomial. The proposed method is also compared with the existing methods for secret sharing schemes and result obtained in the work outperform compared to other methods.

Fourth paper titled “A new Algorithm on application of Blockchain technology in Live Stream Video Transmissions and Telecommunications” define blockchain technology in its classic format. Authors presented fundamental infrastructure to represent new generation of telecommunications. An efficient algorithm is proposed to make secure connections that transfer data packets in any format (boxes or packets of information) in a secure and encrypted method at which sender and receiver of information remain anonymously. Authors explained new emerging technology and its superiority compared to other designed technologies in the field of live streaming and telecommunications, the proposed algorithm shows its superiority compared to other designed technologies in the field of live streaming and telecommunications. Results obtained in this work show that developed method of blockchain about implementing on Video Data Packets on Telecommunications have reliability, consistency and efficiency based on fast time transfer that gives other appropriate obtained results based on Testing and Simulation on OS2 software.

This special issue widely covers all domains of blockchain and de-centralized computing. We are sure that the research work included in this special issue would be great help to understand the dimensions of this emerging technology and identify the research scope of blockchain technology.

We would like to extend our thanks to all the authors who have contributed their research results that will definitely a great help or a resource for other researchers working in this area. Special thanks to Dr. Jingyuan Zhao, the chief editor of the journal for providing all necessary support required from manuscript submission to its final acceptance. At last but not the least, thanks to Ms. Alexis Miller, assistant development editor, IGI Global, as the work would not have reached to its present form without her invaluable help.

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