Editorial

Overview of Blockchain Based Electronic Healthcare Solutions and Security

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1. Introduction

One of the major keywords in the current digital world is the blockchain, which plays a major part in all kinds of advanced service systems, offering more convenience and better efficiency/effectiveness by controlling system hardware intelligently in a way humans have never experienced [1–3].

Meanwhile, as one of the most important opportunities in the fourth industrial revolution, technological fusion—and specifically, applying blockchains to the medical or health care field to extend human life—is emerging. This is because it is possible to change the traditional architectures in these fields to prevent the leakage of personal medical data or effectively utilize it [4]. Such technology makes value judgments about when it is necessary to use medical data safely in collecting, storing, or utilizing it, which will become much more important in the future. Therefore, the medical business system is transforming from the provider's perspective, which offers the data kept in a medical system, to the consumer's perspective. Despite the expected conflict with existing medical laws, blockchains are being used as a tool to utilize personal medical data securely.

Blockchains are also essential in the healthcare or bioelectronics industry, where enhanced service function and sophistication have become critical factors [1]. Thus, this Special Issue (SI) focuses on the blockchain's contribution to human society and provides an opportunity for discussions on the relevant convergence of technologies. Manuscripts discussed their technological aspects, usefulness, and contributing factors of their respective blockchain-based electronic solutions after choosing a suitable subject from the list below or selecting another if needed.

Participants could write about one of the subjects listed below but were not limited to these options [1].

— Electronic blockchain services that prioritize human beings and their lives.
— Electronic solutions that adopt blockchains and/or Big Data.
— Means of aiding and serving people in need, especially disabled or older persons.
— Electronic engineering/mathematical/blockchain theories that would greatly affect science and industry.
— Intelligent blockchain techniques and services for improved systems engineering.
— An open engineering integration system for future systems.

Hence, twelve research papers were selected for this Special Issue, "Blockchain-Based Electronic Healthcare Solutions and Security", and are listed below in order of appearance.

2. Overview of Blockchain-Based Electronic Healthcare Solutions and Security

First, Seong-Kyu Kim and Jun-Ho Huh [5] research "Blockchain-Based Artificial Neural Network Model Using Personal Health Records". Second, Khizar Abbas, Muhammad Afaq, Talha Ahmed Khan, and Wang-Cheol Song [6] introduce "Blockchain and Machine

Learning-Based Drug Supply Chain Management for Recommendation in Smart Pharmaceutical Industry". Third, Jun-Ho Huh and Seong-Kyu Kim [7] design a "Blockchain-Based Certification System: A Secure Smart Contract for P2P Real Estate Transactions". Fourth, Hyun Cheon Hwang, Jin Gon Shon, and Ji Su Park [8] study "A Blockchain-Based Design of Enhanced Web Archiving System Maintaining Content Integrity".

Fifth, Seong-Kyu Kim and Jun-Ho Huh [9] create "A Neuron Blockchain Algorithm for Inheritance-Related Problems". Sixth, Ashutosh Sharma et al. [10] focus their research on "Blockchain-Based Smart Contracts for Internet of Medical Things (IoMT) for e-Healthcare".

Seventh, Aitizaz Ali et al. [11] discuss "Blockchain-Based Security, Privacy, and Reliability in Digital Health Care Systems". Eighth, Linchao Zhang, Lei Hang, Wenquan Jin, and Dohyeun Kim [12] describe an "Interoperable Multi-Blockchain Platform Using Integrated REST APIs for Reliable Tourism Management". Ninth, Vinodhini Mani et al. [13] uncover a "Hyperledger Healthchain for Patient-Centric IPFS-Based Health Record Storage".

Tenth, Seong-Kyu Kim [14] focus on an "Automotive Vulnerability Analysis for Deep Learning Blockchain Consensus Algorithm". Eleventh, Azees Maria et al. [15] create "An Efficient Blockchain-Based Anonymous Authentication and Integrity Preservation Design for Secure Communications in VANETs". Finally, Kejia Chang et al. [16] introduce "An Alliance Chain-Based Medical Data Storage Model".

3. Conclusions

For the Special Issue, "Blockchain-Based Electronic Healthcare Solutions and Security", a wide variety of papers that deal with personal medical history, the smart pharmaceutical industry and medical supply chains, real estate transaction certification for retirement, the improvement of content integrity, blockchains related to inheritance, digital medical system security, stable health care, health history, and vehicle vulnerability analysis have been collected along with research works that focus on blockchains for improving secure communications and alliance chain-based medical data storage models.

In preparation for this Special Issue, the author learned a great deal about the elements that contribute to social and blockchain fusion technologies, and it has become clear that blockchains are valuable as an authentication/certification means in the medical/bioelectronics industry.

It is expected that future Special Issue(s) may deal with some of the new systems that incorporate novel multimedia technology such as VR, AR, the metaverse, or a hologram, which is beyond the scope of the current edition. In this regard, for "Blockchain-Based Electronic Healthcare Solutions Volume 2", the door will be opened for these subjects as well.

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