Chapter 2
Evolution of Cloud Computing With Blockchain and IoT

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ABSTRACT

Blockchain is presently bringing a revolution in numerous industries like finance, healthcare, supply chain, insurance, registry, and the internet of things. Numerous industries integrate blockchain with their frameworks for the advantages of the blockchain. The growing demand for health has led to development of hospitals and medical institutions further leading to an increase in the medical data and the need for managing it. Thus, the authors discuss blockchain technology in association with the medical sector. Health records including personal details of the patients are to be kept confidential. These records are saved in the medical clouds, but they can be misused by the other parties deleting the original data or modifying it. The problems related to the healthcare industry have been discussed.

INTRODUCTION

Recent years have witnessed tremendous increase in the use of IoT devices which are dedicated to meet ever-growing demands of the industry. These demands consist of parameters such as flexibility, low latency, high availability and above all ubiquitous availability in order to provide uninterrupted services to the customers. IoT mainly focuses on collecting data from the devices and then process it. According to (Gartner, S. 2013), an increase from 780 million IoT devices in 2016 to 26 billion devices in 2021 will be witnessed worldwide. This definitely means more type of smart devices such as smart manufacturing devices, smart transportation devices, etc. will be witnessed soon. Years in the recent past have made many technological advances amongst which IoT devices have transformed a lot in context of proper architectures, more standardized protocols etc. Earlier, a centralized architecture using mainframe technology was used to deploy IoT devices, however, now a cloud based architecture is used. Though this architecture gave numerous advantages over the earlier used architecture but has certain loopholes too. The data generated by the IoT devices is private thus the decentralised cloud based architecture may sometimes pose security threats which may threaten the IoT culture. The major reason supporting this threat is single point of failure which is commonly known as SPOF and also the involvement of third party authorities. Existing methods which handle security of systems generally use third party entities for this. For users to trust the third party is indeed a difficult ask and more difficult is for the service providers to convince users that their data is in safe hands because there have been cases where the data was misused or leaked by the third party, usually not intentionally but their own system was hacked. Like this many issues still prevail in the current IoT architecture which is hindering it to be used as a generic platform to run many applications. Thus the need of blockchain was felt.

With the trend of IoT devices gearing up, blockchain is another technology which is playing a tremendous role in shaping the future of the IoT devices and also changing the way how information is exchanged in financial and industrial sectors. Real estate, crypto-currencies, and finance are the major consumers of blockchain technology these days. Basically, blockchain can be viewed as an immutable and decentralized public database which is based on P2P (peer-to-peer) architecture. Since it is decentralised, this means that information related to transactions cannot be controlled by any of the single entity present in the network. Blockchain came into existence just to build more trust amongst the stakeholders when dealing with money transactions etc, thus, in order to keep the trust and validate only the legitimate transactions, it uses cryptography and consensus mechanisms. Using these techniques prevents the linked blocks from any modifications and changes (Tschorsch, F., & Scheuermann, B. 2016), yet all the transactions which are stored

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