

Chapter 5

Bank Data Certification and Repurposing Using Blockchain

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ABSTRACT

Privacy protection is one of the basic needs for supporting a good interaction in a globally interconnected society. It is important not just for business and government but also to a huge and increasing body of electronic or online societies. In such situations, a traditional digital ledger storage systems seems more centralized. Security of traditional digital ledger system has always been a greater concern when considered for implementing at a huge scale. When such sensitive data is at stake, there should be nothing doubtable about the system's strength to secure data and withhold itself against any potential attacks. Blockchain is one way through which such potential security issues can be solved. A blockchain, actually block chain, is basically a continuously increasing list of records, which are called blocks; these blocks are linked and secured mainly using cryptography. Every block typically has a cryptographic hash of the block previous to it, along with a timestamp and data of the transaction.

INTRODUCTION

Since its inception, the blockchain technology has shown promising application prospects. From the initial cryptocurrency to the current smart contract, blockchain has been applied to many fields. Although there are some studies on the security and privacy issues of blockchain, there lacks a systematic examination on the security of blockchain systems (Thomas, 2017). Since the debut of Bitcoin in 2009, its underlying technique, blockchain, has shown promising application prospects and attracted lots of attentions from academia and industry. Being the first cryptocurrency, Bitcoin was rated as the top performing currency in 2015 and the best performing commodity in 2016, and has more than 300K confirmed transactions

DOI: 10.4018/978-1-7998-5351-0.ch005

daily in May, 2017. At the same time, the blockchain technique has been applied to many fields, including medicine economics, Internet of things, software engineering and so on. With the decentralized consensus mechanism of blockchain, smart contracts allow mutually distrusted users to complete data exchange or transaction without the need of any third-party trusted authority. Ethereum is now (May of 2017) the most widely used blockchain supporting smart contracts, where there are already 317,506 smart contracts and more than 75,000 transactions happened daily.

A BlockChain, an actually block chain, is basically a continuously increasing list of records, which is termed as blocks, these blocks are linked and secured mainly using cryptography. Every block typically has a cryptographic hash of the block previous to it, along with a timestamp and data of the transaction. The design of the BlockChain is such that it is basically resistant to modification of its transaction data (Mahdi H et al., 2018).

BlockChain is an open, distributed ledger which records transactions between any two clients efficiently and in such a manner that those transactions are verifiable and are permanent. BlockChain is usually maintained by a peer-to-peer network which collectively adheres to a protocol for communication between nodes and validating new blocks (Xiaoqi Lia et al., 2018). After a transaction is recorded it is not possible to alter the data in any given block without changing all previous blocks, which requires high computational power.

As Bitcoin (Fangfang Dai et al., 2017) emerged in 2009 with it BlockChain gained prominence and though it now exists for almost a decade, people are still not able to fully understand the potential of it. Experimental solutions that are beyond crypto-currencies like Ethereum, Bitcoin show a future for elementally changing society and with such innovations right now we may look at the dawn of cryptographically secured and trust-free transactions economy.

“The trust machine” that was the term coined by The Economist recently, which indicates that blockchain has potential for taking care of trust issues, which in turn frees people from implementing a method to show or convey trust. With similar words, the implemented system is working without any trust concerns, making the transactions “trust free”, once it makes an impression as agreement in blockchain. Bitcoin blockchain showed us that it was just a beginning, as the availability of generic blockchains and self-programmable blockchains increased, like the once provided by Ethereum, blockchains are now being used in areas beyond crypto-currencies. These features trust-free, highly secure and transparent nature of blockchain paved the way for utilizing it in other application areas. For example, Samsung and IBM plan to experiment with blockchain to produce IOT solutions.

State of Art Development

In this section, studies were conducted, different techniques were studied and evolved, and most of the research carried out was to exploit BlockChain advantages.

In (Orcutt et al., 2017), Studies carried out give a full detail and knowledge of Zero-Knowledge proof. The idea of zero-knowledge proofs has been known to developers for a very long time, but it wasn't until recently that researchers figured out what the technology actually holds: It's a mathematical concept that lets users share data with any users without actually revealing the contents of the data. In other words, the user can only prove that he is the owner of the data without revealing a single bit of information to the verifying party.

In (Beck et al., 2016), author discusses about the vast advantages of BlockChain and briefly explains the way they can be used in industry; the scopes of article basically involves how by incorporating a trust-

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