University of Information Technology and Sciences (UITS)

Assignment No 1

Computer, Data and Network Security

This assessment about BlockChain

Submitted To:

Shuv Saha
Lecturer,
Department of IT , UITS

Submitted By:

Name: Nazmul Zaman
Student ID:2014755055
Department of IT UITS

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1 Abstract

Blockchain has recently been one of the most publicized subjects in the computing world, as well as in the financial technology (FinTech) industry. According to experts, blockchain is the future of monetary transactions and safe information transmission. Blockchain has the capacity to alter the way the world moves forward. For example, if you want to purchase any asset, such as a house, a car, or any other tangible or intangible property, you must currently go through a lot of paperwork and labor-intensive effort. However, blockchain simplifies life by completing these time-consuming tasks in a short amount of time. Blockchain is a simple block of transparent digital information that is highly secure, shareable but immutable.Transparent digital information means the data exploited is traceable and identifiable. In this chapter, we present briefly what blockchain is, how it works, and what the major application areas in the real world are.

2 Keywords

Big Data, Blockchain, Cryptography, Data Analytics, Digital Currency, Information Security, Internet of Things, Private Key, Public Key, Transaction.

3 Introduction

Blockchain is one of the most recent technologies for managing any digital asset transaction, as well as physical assets and agreements, in terms of security, traceability, and transparency.
In this chapter, we will learn about blockchain.

4 Objective

There are we talk about many part of blockchain.
1.The history and evolution of blockchain are depicted and covers the types of blockchain and how It's work.
2.Application on block chain.
3.Challenges and opportunities of blockchain.
4.what the benefits and limitations of blockchain are, as well as the area of blockchain implementation, from which we can gain the advantages of blockchain.
5.Future scopen of blockchain.

5 Evolution:

The evolution of blockchain can be divided into three stages: Transactions, Contracts, and Application.
Transactions in Phase 1 (Blockchain 1.0 and Bitcoin):
From 2008 to 2013, this phase will last. During this time, Blockchain 1.0 was in use, and its primary purpose was to conduct peer-to-peer transactions. At the time, bitcoin was the most visible blockchain technology application, and everyone was focused with bitcoin transactions and mining.

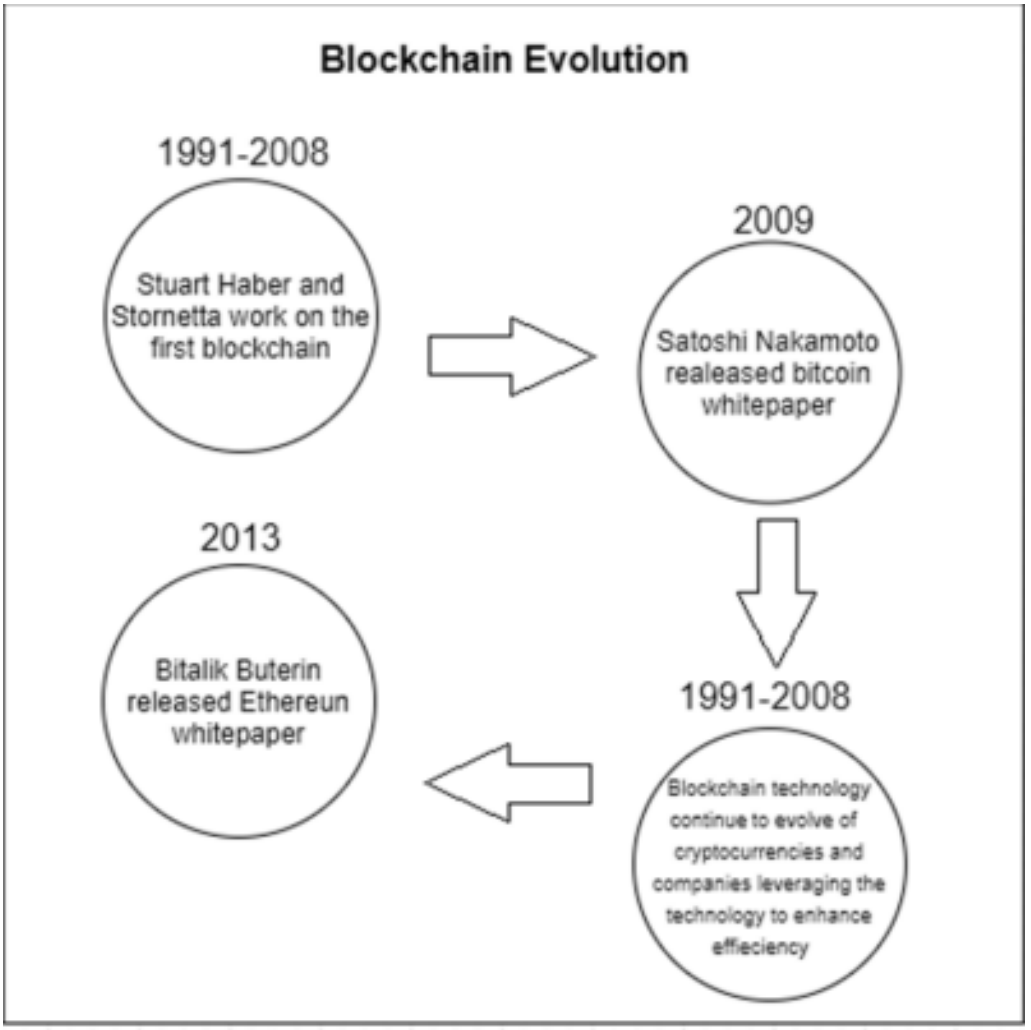

Figure 1: Schema

Contracts (Blockchain 2.0 and Ethereum): Phase 2:
The contract phase timetable appears to be between the years of 2013 and 2015. Another possibility of blockchain technology was discovered during this stage. The fundamental feature of this age was decentralization. During the transaction phase, communication was largely peer-to-peer, although it was employed in a dispersed form here, and smart contract technology was frequently deployed. Smart contracts transformed blockchain from a money to a platform for decentralized applications.

Phase 3 of the application (Blockchain 3.0 and the Future):
The history of blockchain does not end with bitcoin and Ethereum. In recent years, many projects have created additional blockchain features. In 2018, various apps began to use blockchain technology, and blockchain was secured with biometric additions such as facial recognition, voice matching, and fingerprints. The IoT network is being aggregated to blockchain platforms, and more new platforms and apps are beginning to leverage blockchain in their daily operations.

6 Types of Blockchain

1.Public Blockchain
1.Private Blockchain
3.Consortium Blockchain

7 How blockchain work

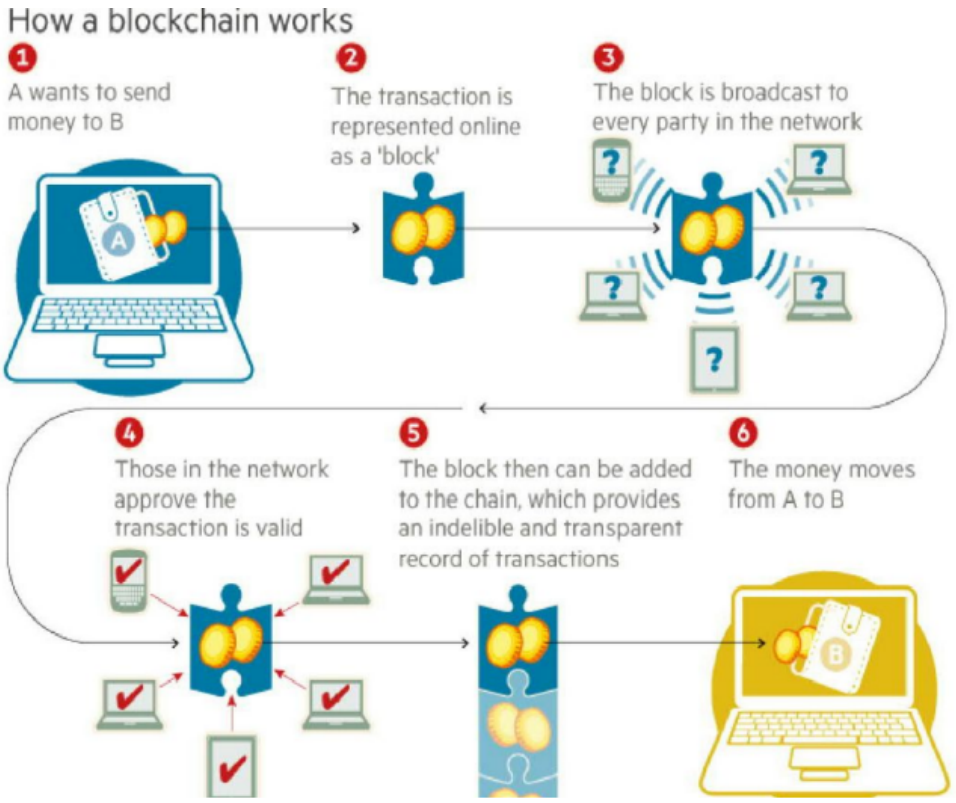

Figure 2: Schema

8 Applications of Blockchain

8.1 Data Analytics:

Data analytics (DA) is the process of analyzing data sets to draw conclusions about the information contained within them. This entails retrieving meaningful information from massive data collections. Data has just been converted into cash, and data analytics is at the center of this change. Data analytics is used in industries ranging from financial management to marketing to foresee the future.However, using data in this manner to extract trends and insights has significant limitations, such as educated specialists and expensive equipment. These can be reduced to the bare minimum with the use of blockchain. Blockchain is a distributed network of diverse machines and algorithms that can be used to reduce the cost of data analysis for massive data sets.

8.2 Big Data:

Big data refers to data collections that are either too enormous or too complicated for typical data processing application software to handle effectively. So far, we've learned about data analytics, which also deals with huge data. Blockchain offers another data layer to the big data analytics process when used for data analytics. This data layer adds two extra values to big data, which are as follows:
1. Blockchain-generated big data is secure since it cannot be falsified owing to network architecture.
2. Blockchain-based big data is structured and complete, making it ideal for further analysis.
3.Security – Every single record inside a block in a blockchain is highly secured, which makes it very difficult for any data to be tampered with.

8.3 Information Security

The future of information security, or cyber security, relies on blockchain technology.
1. Authenticated edge computing.
2. advanced secrecy and data integrity.
3.secure private messaging.
4. enhancement of public key infrastructure.
5. Maintaining the domain name system; DDoS attacks have been reduced.

8.4 Cyber Physical System/Smart Grid

A cyber physical system (CPS) is a mechanism that is strongly integrated with the internet and its users and is controlled or monitored by a computer-based algorithm.
1. Device and resource heterogeneity.
2. Multiple attack surfaces.
3. Scalability
4. Centralization.
5. Lack of control over data exchange and auditability.
6. Complex interplay of different operating systems, software stacks, and hardware;
7. Different security or privacy mechanisms implemented.

8.5 Education

There is a widespread misperception that blockchain is exclusively concerned with network security. However, we have now investigated other businesses that could benefit from this technology. Education, like the other areas mentioned, is an important area where blockchain is being used. Editech is quickly increasing, with a

projected net worth of 93.76 billion by 2020.Blockchain technology has the potential to create an entire transcript for a student.

9 Opportunities and Challenges

Blockchain technology holds great promise and potential in any service that involves data and data transactions. Examples include FinTech companies, banks, E-commerce, mobile commerce, cloud data services, end-to-end messaging services, data analytics, the internet of things, healthcare sectors, medical data sharing infrastructures, and cyber physical systems. Aside from the businesses mentioned above, we have observed other blockchain installations. Blockchain also creates a slew of new career prospects in the business, as shown below:

9.1 Blockchain Developer

Blockchain Developer:- The key responsibilities include creating, implementing, and supporting a network built with blockchain at various stages of production and development. Other responsibilities will include requirements analysis, designing blockchain technology around a specific business model, researching new technical solutions and protocols, creating and automating blockchain development workflows, implementing test-driven development practices, and constructing and launching a blockchain network.

9.2 Blockchain engineering

Blockchain engineering :- Dsign blockchain infrastructure, end products on top of it, and meta transaction architecture employing mobile applications, as well as development around document-signing frameworks and supporting infrastructure, and develop APIs that connect with the blockchain.

9.3 Blockchain Platform Engineer

Blockchain Platform Engineer: - In addition to providing expertise and development assistance to blockchain initiatives across the organization, the blockchain platform engineer develops subject matter expertise on blockchain network platforms, architectures, and administrative/operational requirements. He or she creates and constructs.

10 Future Scope of Blockchain

The general public views blockchain as a technology exclusive to Bitcoin. This is not the case, as this technology has far-reaching capabilities that go beyond simply converting currency. Despite being a new and growing technology, blockchain is already making waves in a range of corporate and industrial applications.

Because blockchain is a decentralized ledger of data divided into blocks and disseminated across multiple nodes, ledgers can be independent of any third-party validating authority. Data is available to anybody while remaining secure and immutable because to decentralization and cryptography. Because of these properties, blockchain is a promising implementation for the foreseeable future. The industries listed below are driving blockchain innovation and influencing the global economy's future.

10.1 Use in Digital Advertising

Digital advertisers and brands are facing several challenges in the form of bot traffic, payment inefficiencies, lack of data transparency, etc. With some industry players indulging in malpractices to drive profits, it has become ever so important for others to take corrective measures. Decentralized verification can address issues in payments and fake traffic. This makes the future of blockchain in digital advertising quite imminent.

10.2 Implementation in Finance

Security and transparency are two of Blockchain's essential qualities, and the finance industry was one of the revolution's early adopters. Trade finance, for example, has reduced processing time, decreased paperwork, and become more cost-effective while maintaining security and confidence.

In finance, there is always the danger of data and information tampering. With the use of distributed ledgers, businesses have been able to eliminate such intermediaries that have centralized control over databases. Any change or alteration to the ledger must be approved by a majority of network participants.

10.3 Consolidation of Cloud Storage

Cloud storage and cybersecurity are two such areas that can significantly harness the potential of blockchain to enhance its value proposition. Centralized servers have always been prone to attacks and data theft, but blockchain implementation has the potential to considerably bring down such threats. Cloud storage and development

are becoming a norm and with such scale, there is going to be a need for robust and secure systems.

10.4 Supply Chain Management

Although it may appear strange that blockchain may have an impact on the supply chain industry, firms such as Walmart have successfully integrated blockchain technology at various stages of their supply chain. This has aided businesses in authenticating product quality and forecasting delivery timelines, hence influencing the overall value provided to the consumer. Retail organizations have been able to trace the origin, quality, and shelf-life of products because to blockchain deployment.

10.5 Implementation In Banking And Insurance

Blockchain technology, like the other aforementioned legacy businesses, has made significant inroads into the banking industry. Barclays was among the first banks to employ distributed ledger technology in its operations. The widespread deployment of blockchain technology has helped several banks. The introduction of smart contracts into the insurance industry has thrown up a world of exciting possibilities. The insurance sector is primarily reliant on paperwork and documentation, which slows down operations. The sector, however, is going to experience a massive shift because to decentralized ledgers and smart contracts.

11 Limitation of Blockchain Technology

Blockchain technology offers enormous promise for creating trustless, decentralized applications. It is, however, not without problems. There are various obstacles that make blockchain technology unsuitable for general use. The image below demonstrates the limitations of blockchain technology.

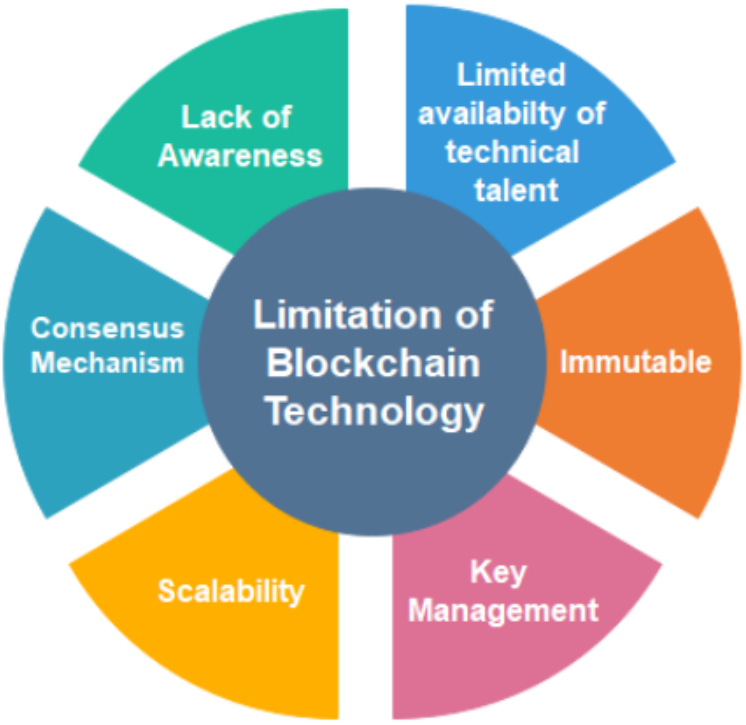

Figure 3:

11.1 Lack of Awareness

There has been much discussion about blockchain, but many people are unaware of its genuine usefulness and how it may be applied in many scenarios.

11.2 Limited availability of technical talent

Today, there are numerous developers available who can handle a wide range of tasks in any business. However, there aren't many blockchain developers available who specialize in blockchain technology. As a result, the shortage of coders makes creating anything on the blockchain challenging.

11.3 Immutable

We cannot make any changes to any of the records in immutable. It is extremely useful if you want to maintain the integrity of a record and ensure that no one tampers with it. However, there is a disadvantage to immutability. We understand if you want to make modifications or go back and make changes. For example, you may have processed a payment and now need to go back and alter it.

11.4 Key Management

As previously said, blockchain is built on cryptography, implying that there are various keys, such as public keys and private keys. When dealing with a private key, you also run the risk of someone acquiring access to it. It was popular in the early days of bitcoin when it didn't have any value. People would just buy a huge number of bitcoin and then forget the key, and those bitcoins may be worth millions of dollars today.

11.5 Scalability

Blockchain, like bitcoin, uses consensus procedures that require transaction verification by every node that participates. It limits the number of transactions that a blockchain network can process. As a result, bitcoin was not built to handle the massive amounts of transactions performed by many other businesses. At the moment, Bitcoin can execute up to seven transactions per second.

12 Conclusion

In this assignment I learn about Blockchain in details.I also learn about blockchain history and evolution,application,challenges and future scope of blockchain and learn the limitations and how It's work in our reallife .All of these above we can say blockchain is always plays a important role in our tecnological generation and our reallife.

13 reference

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