Block Chain Technology (Introduction)

Dr. Siddhartha Roy

Lecture 1

- Introduction
- Use Case: Supply Chain
- Some Issues
- Definition
- Application
- Some points to remember

Introduction

- Blockchain is a system in which the information will be recorded in a way that makes it hard or impossible to modify, hack, or fraud the system. A blockchain is basically a digital ledger of transactions that is duplicated and distributed across the entire network of computer systems on the blockchain. Blockchain is the backbone Technology of Digital CryptoCurrency(encrypted data string that denotes a unit of currency) such as BitCoin, Ethereum, Litecoin etc.

Successful Supply Chain implementation

- Required Strong coordination among business entities
- Getting Real time information from business entities.
- How to get real time information ? Through Web based portal?
- What is the guarantee that the information submitted is correct?
- If any one denies the information later on?
- We need decentralized solution where no one trust each other but they should cooperate with each other
- Block chain is the solution

- In a business network of different players (businesses, enterprises, Government or Private bodies, or even the individuals)

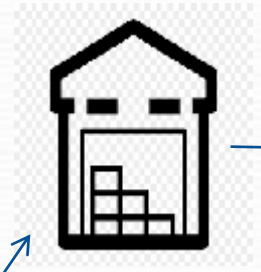
•Everyone has one objective to fulfill their goal

•They do not trust each other

.Proper cooperation is required to obtain desire goal

•**Trust less Decentralization = Blockchain**

Typical Scenario of Supply Chain of Computer Industry



Manufacturer

Assemble unit

250 unit Silicon
400 unit Fiberglass
500 unit Copper
250 unit Transistor
100 unit Capacitor
50 unit CPU
40 unit Motherboard
30 unit RAM

Supplier

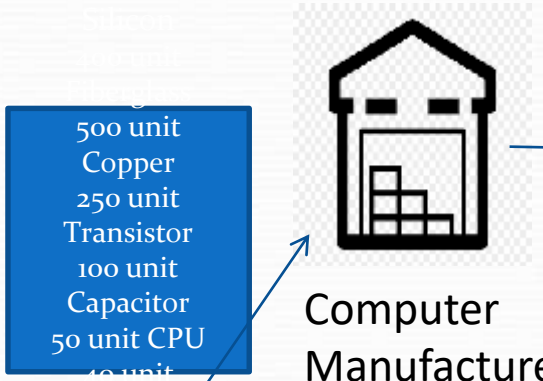
Warehouse

Basic assumptions

- A board is shared with all the business entities
- The board has infinite space, where information can not be deleted
- Everyone can view all the logs and verify
- Any change in information is visible to everyone
- Once the information entered cannot be deny later

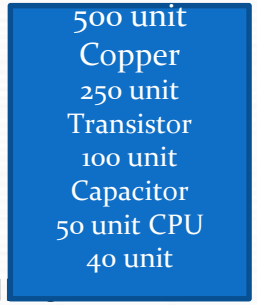
Some issues

- Who will maintain this board? Cloud service provider?
- Who will bear the cost ?
- Suppose one of the enterprise maintain private cloud but what is the guarantee it is not fraud?
- Let everyone maintain the same copy of the board individually and independently
- No one is the sole-owner of the data, but everyone has a copy of the data
- There is no central database

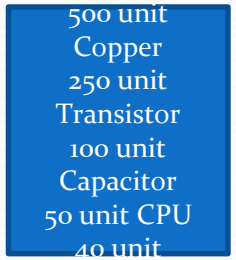


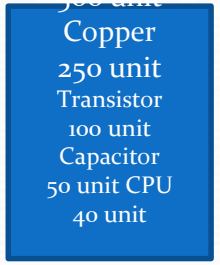
Computer Manufacturer

Assemble u



Supplier





Warehouse

- Everyone holds exactly the same copy of the data at the same instance of the time
- An immutable append-only ever-growing chain of data. Data once added cannot be deleted or modified later
- There is no central database to store the chain
- Everyone keeps a copy of the chain and processes data locally
- New information is added to the chain in the form of new blocks
- Blockchain ensures that every party has the same view of the blockchain always
- The Information is transparent to everyone –so everyone can verify and validate
- A decentralized immutable append-only public ledger

Definition of Block Chain

- An immutable append-only ever-growing chain of data. Data once added cannot be deleted or modified later.
- Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. Virtually anything of value can be tracked and traded on a blockchain network, reducing risk and cutting costs for all involved.

Some typical Application of Block chain Technology

Investment Management

Digital IDs (Passports, Personal IDs, Marriage Certificates)

Digitizing the land and property records

Supply Chain Management

Some points to remember

- Blockchain is not a Bitcoin (or any other cryptocurrencies)
- Here we discuss the technology and its applications not the legal issues of
- Cryptocurrencies
- Anything in the world cannot be solved using a Blockchain . Blockchain is good but it is not one and only solution to change the society
- Block chain technology can be used for fraud prevention but there are better technology to solve that problem
- Blockchain is not a distributed database.
- A lack of awareness of the blockchain technology and understanding of how it works , especially in all other sectors other than banking

References

- Cryptography and Network Security – Principles and Practice by William Stallings, Pearson (2017)
- Blockchain Basics: A Non-Technical Introduction in 25 Steps by Daniel Drescher, Apress (2017)
- Blockchain: Blueprint for a New Economy Paperback(2015) by Melanie Swa
- https://btc.com/btc/blocks
- https://www.businessinsider.com/blockchain-technology-applications-use-cases