Anti-Counterfeit on Medicine Detection Using Blockchain Technology

By
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What is Blockchain

1. A blockchain is essentially a digital ledger of transactions that is duplicated and distributed across the entire network of computer systems on the blockchain.

2.Each block in the chain contains a number of transactions, and every time a new transaction occurs on the blockchain, a record of that transaction is added to every participant's ledger. The decentralised database managed by multiple participants is known as Distributed Ledger Technology (DLT).

3.Blockchain is a type of DLT in which transactions are recorded with an immutable cryptographic signature called a hash.

TYPES OF BLOCKCHAIN

1. **Public Blockchain**
2. **Private Blockchain**
3. **Consortium Blockchain**
4. **Hybrid Blockchain**

Public BlockChain

A public blockchain is a non-restrictive, permission-less distributed ledger system. Anyone who has access to the internet can sign in on a blockchain platform to become an authorized node and be a part of the blockchain network.

Example: Bitcoin , Ethereum

Private Blockchain

A private blockchain is a restrictive or permission blockchain operative only in a closed network. Private blockchains are usually used within an organization or enterprises where only selected members are participants of a blockchain network.

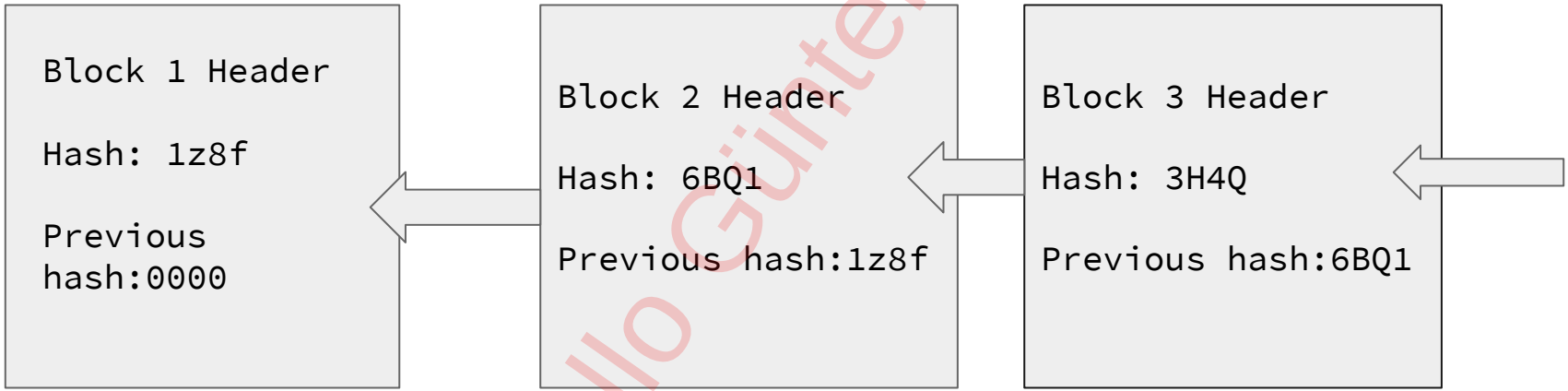
Consortium blockchain

A consortium blockchain is a semi-decentralized type where more than one organization manages a blockchain network.

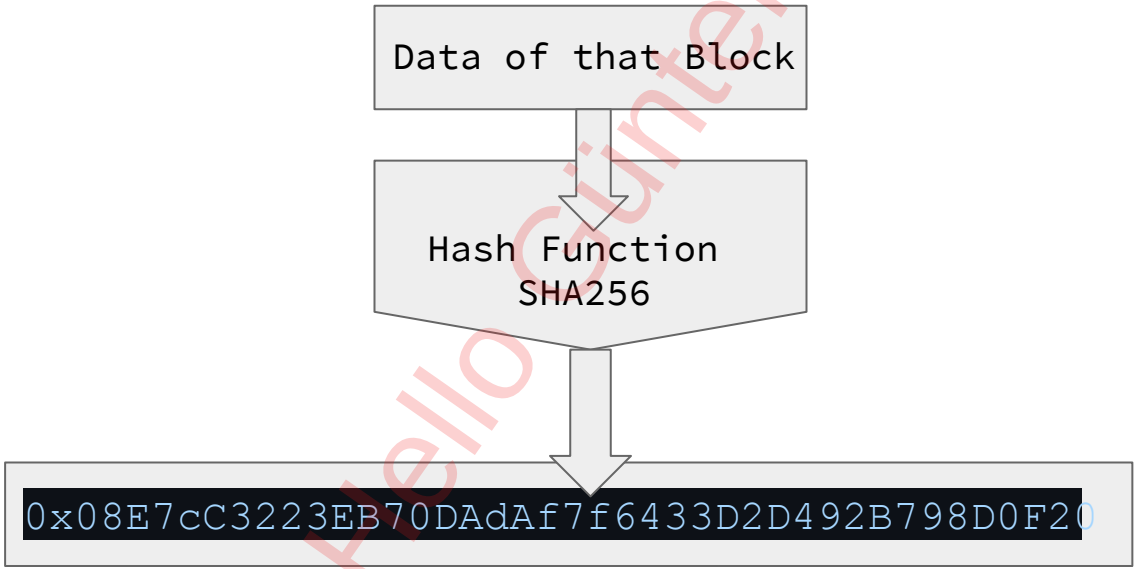
Hybrid blockchain

A hybrid blockchain is a combination of the private and public blockchain. It uses the features of both types of blockchains that is one can have a private permission-based system as well as a public permission-less system.

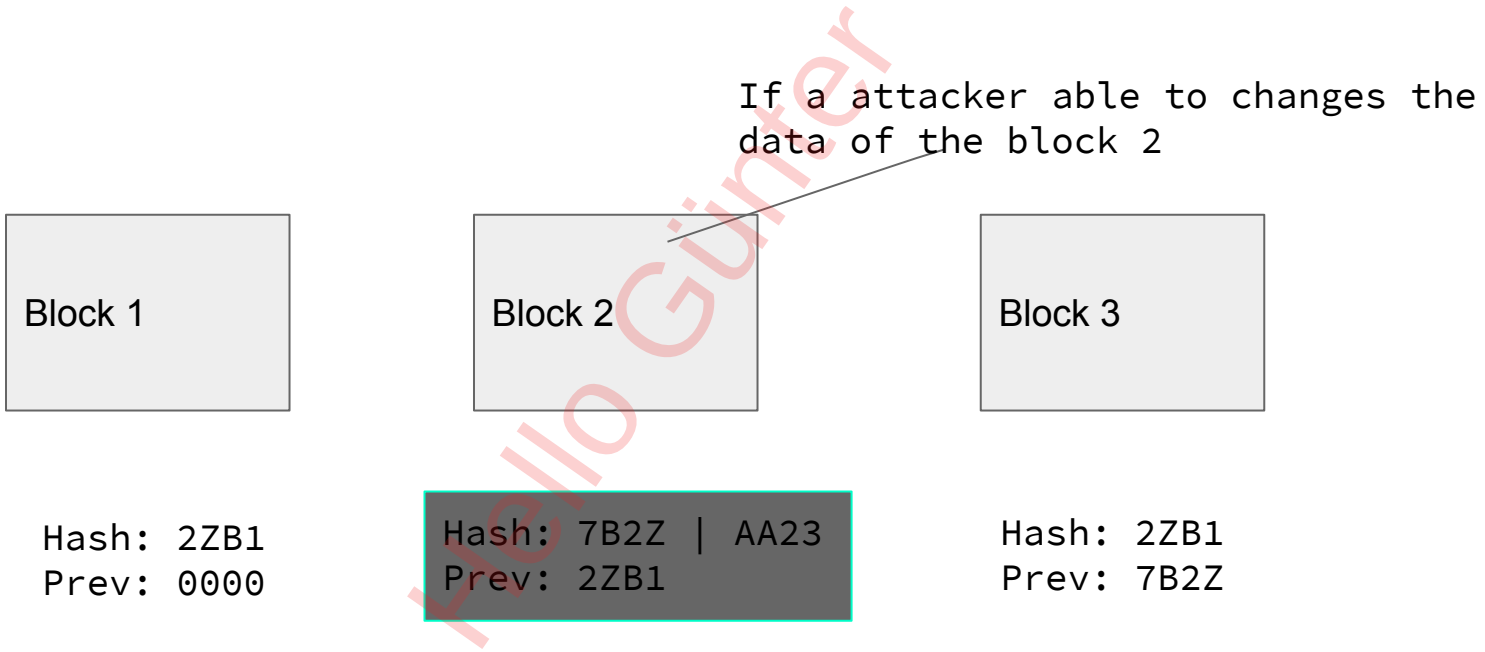
Blockchain Architecture



Hashing In BlockChain



This SHA256 Algorithm creates a 256 bit hash from the data of the block.This hash can be understood as a fingerprint which is unique to each block.



Consensus Algorithm

A consensus algorithm is a procedure through which all the peers of the Blockchain network reach a **common agreement** about the present state of the distributed ledger.

- **Proof of Work.**
- **Proof of Stake.**
- **Proof of Burn.**
- **Practical Byzantine Fault Tolerance**

Proof of Work

This consensus algorithm is used to select a miner for the next block generation. Bitcoin uses this PoW consensus algorithm. The central idea behind this algorithm is to solve a complex mathematical puzzle and easily give out a solution. This mathematical puzzle requires a lot of computational power and thus, the node who solves the puzzle as soon as possible gets to mine the next block.

Ethereum

Ethereum is a distributed computing platform built on blockchain technology. One way to think of it is as a “world computer” in which anyone, anywhere can run an application and have an unlimited amount of processor power available to them. Apps that run in ethereum are very secure because no third party can manipulate them. This Applications are known as **Daaps.**

Smart Contracts

A smart contract is a self-executing contract with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized blockchain network.

Example of how blockchain works

- In a online voting system using blockchain whenever user gives vote a block for his vote will be added to the blockchain.
- This all blocks have a unique id.so user can see his vote any time in this network
- And due to blockchain no one can temper with that data.
- So it’s become so much secure and trustworthy.

Motivation

1. The use of counterfeit medicine can be harmful to health. Their use may result in treatment failure or death.
2. They not only harm patients but also the reputation of medicines and healthcare providers.
3. They lose billions of dollars every year in sales and spend large sums of money on anti-counterfeit measures. This is majorly due to huge gaps in pharmaceutical supply chains.

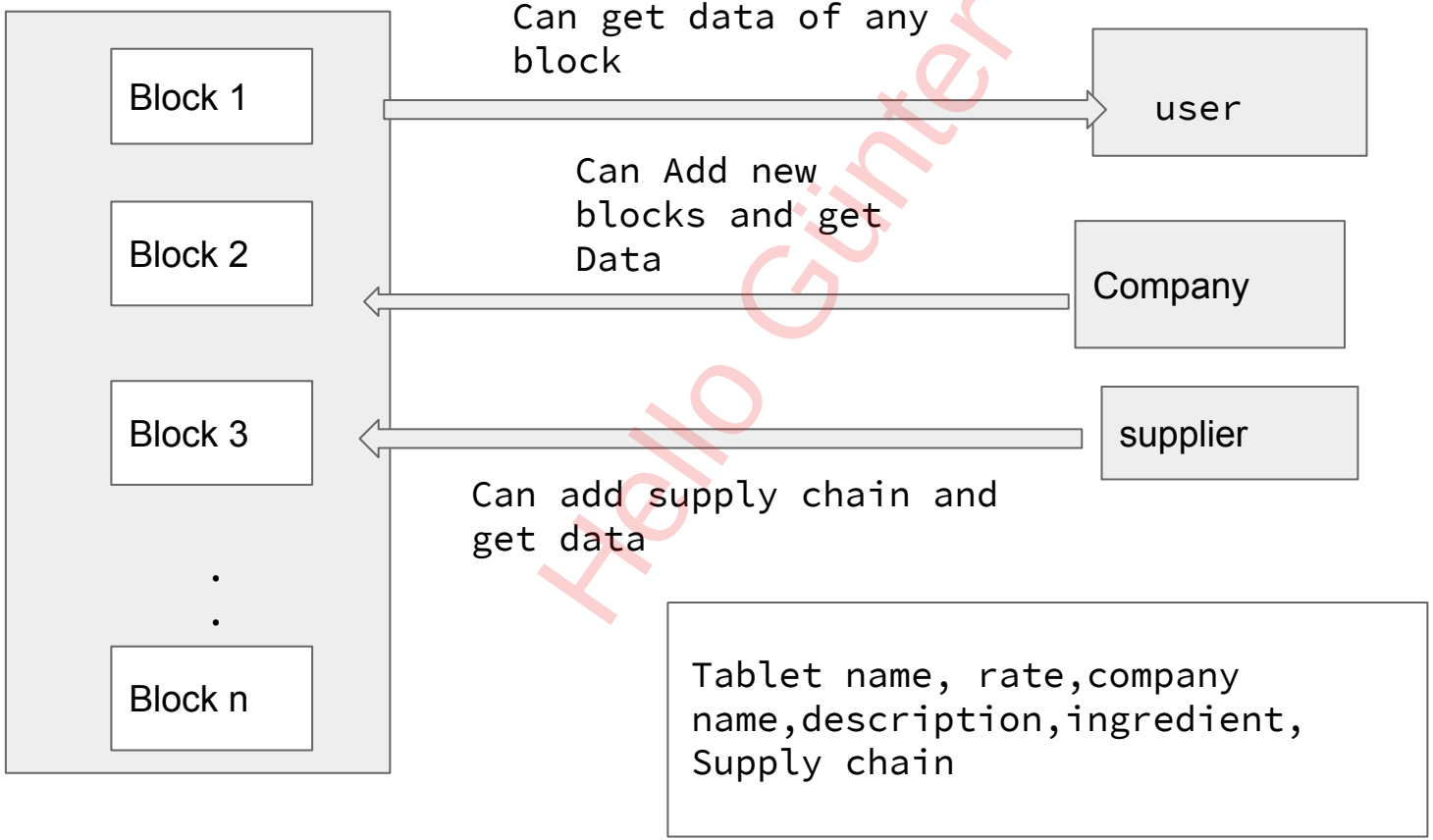
Drug traceability with blockchain

Blockchain can help to prevent counterfeit drugs by significantly enhancing the security and transparency of supply chains. It can be used to easily trace the flow of medical goods from sellers to customers.

Algorithm of this project

- User Enters the medicine id in the system.
- System Response to the user and sen details or request to the network and ensures authentication
- In the blockchain the details of the particular medicine are created from the manufacturer while creating blocks.All this blocks a have an unique id.This ids are generated using SHA256 algorithm.
- So Only one block which has the same id will response at a time
- User can compare the details of the medicine they have with the datasets already present.So if they matchs the medicine is not fake otherwise it has high probability of being fake.

Structure of our Data



Why Blockchain here?

1. That's why circulating a fake drug becomes next to impossible with blockchain.

2. Any movement of medicines from one party to another can be visible to all authorized members and traceable in real-time.

3. Consumers can verify the authenticity of purchased medicines by scanning a QR code or a bar code. Also, they can quickly look up for the information about the manufacturer and other relevant details.

Future Scope

1. Recently, several companies, including Sanofi, Roche, McKesson, and Walmart, teamed up to introduce Medi Ledger project: a blockchain-based solution to prevent counterfeit drugs.
2. Zuellig Pharma, a pharma giant in the Asia-Pacific region, aims to use blockchain to collect data across supply chains in a secure manner. The company has developed eZTracker smartphone app to verify the authenticity of a drug by scanning a barcode.
3. Another company, Real Items has partnered with Tricol Trading Company (one of the largest microfiber manufacturers in Asia) to trace the supply chain and ensure authenticity for their KN95 masks exported from China to the US.

Thank you

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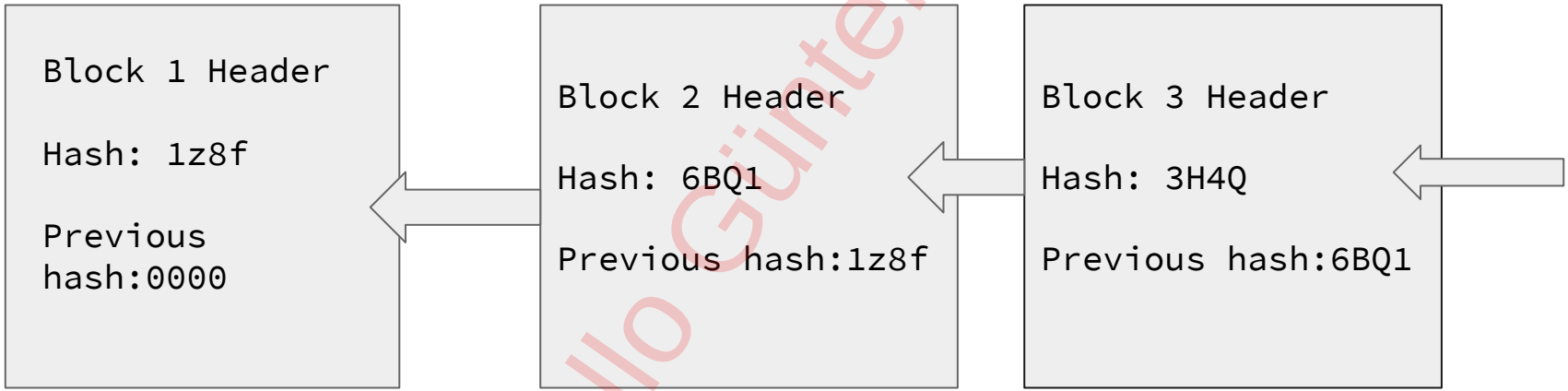

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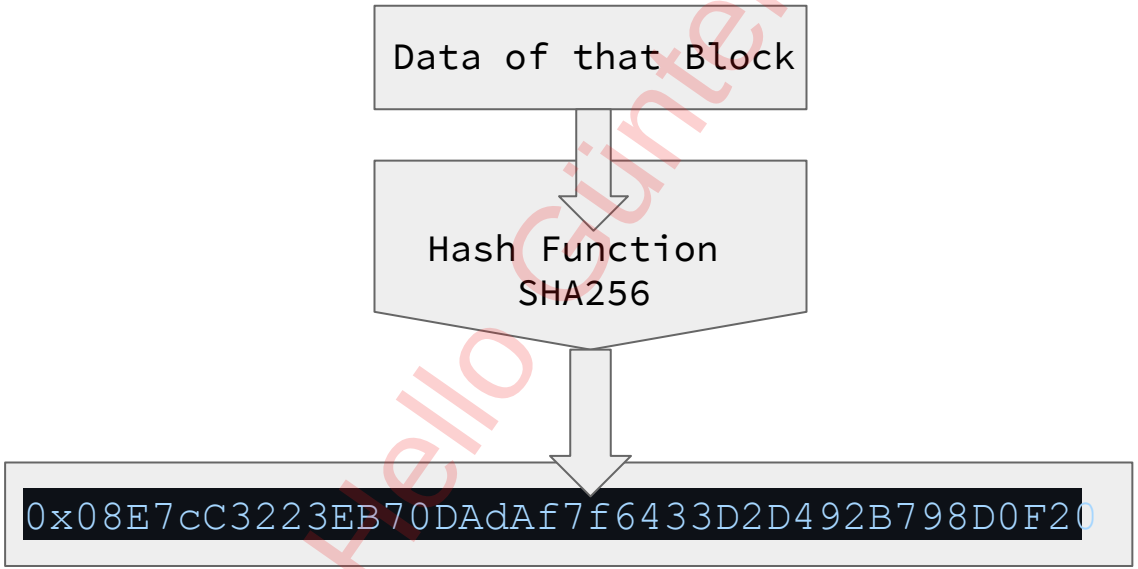

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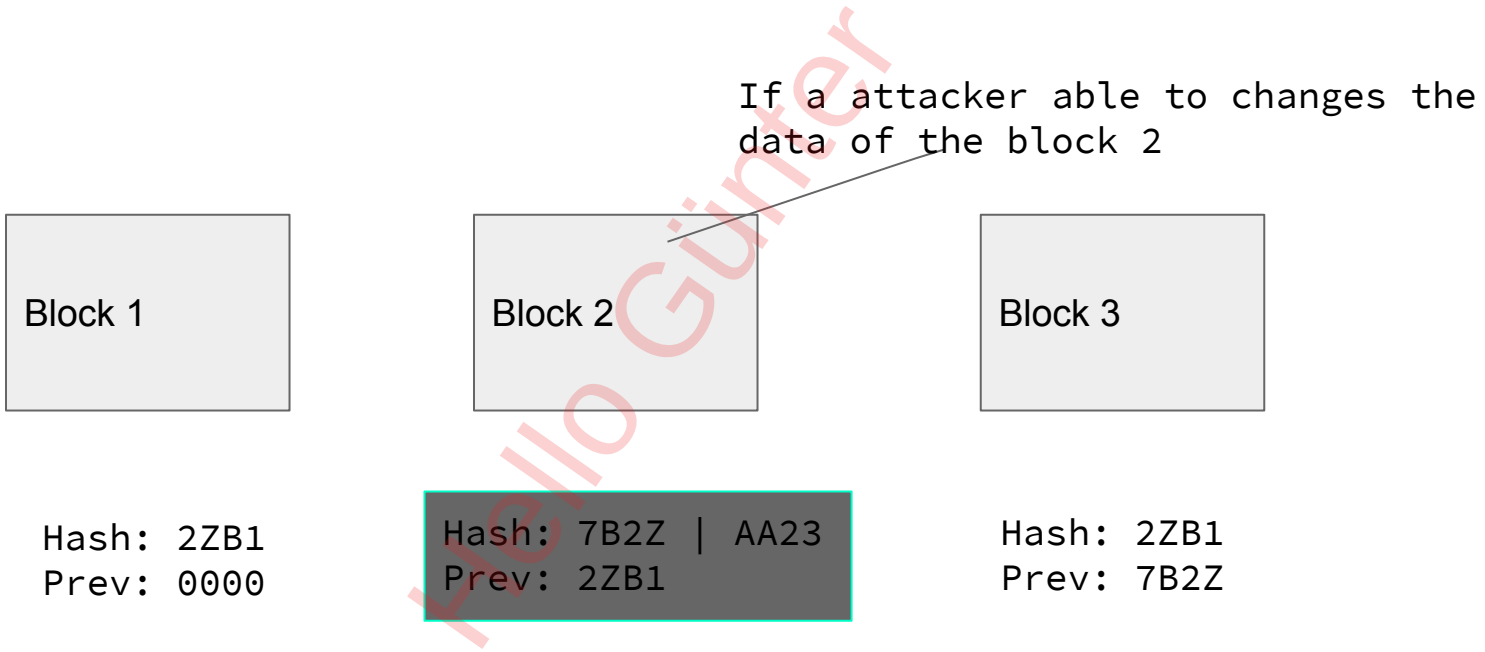

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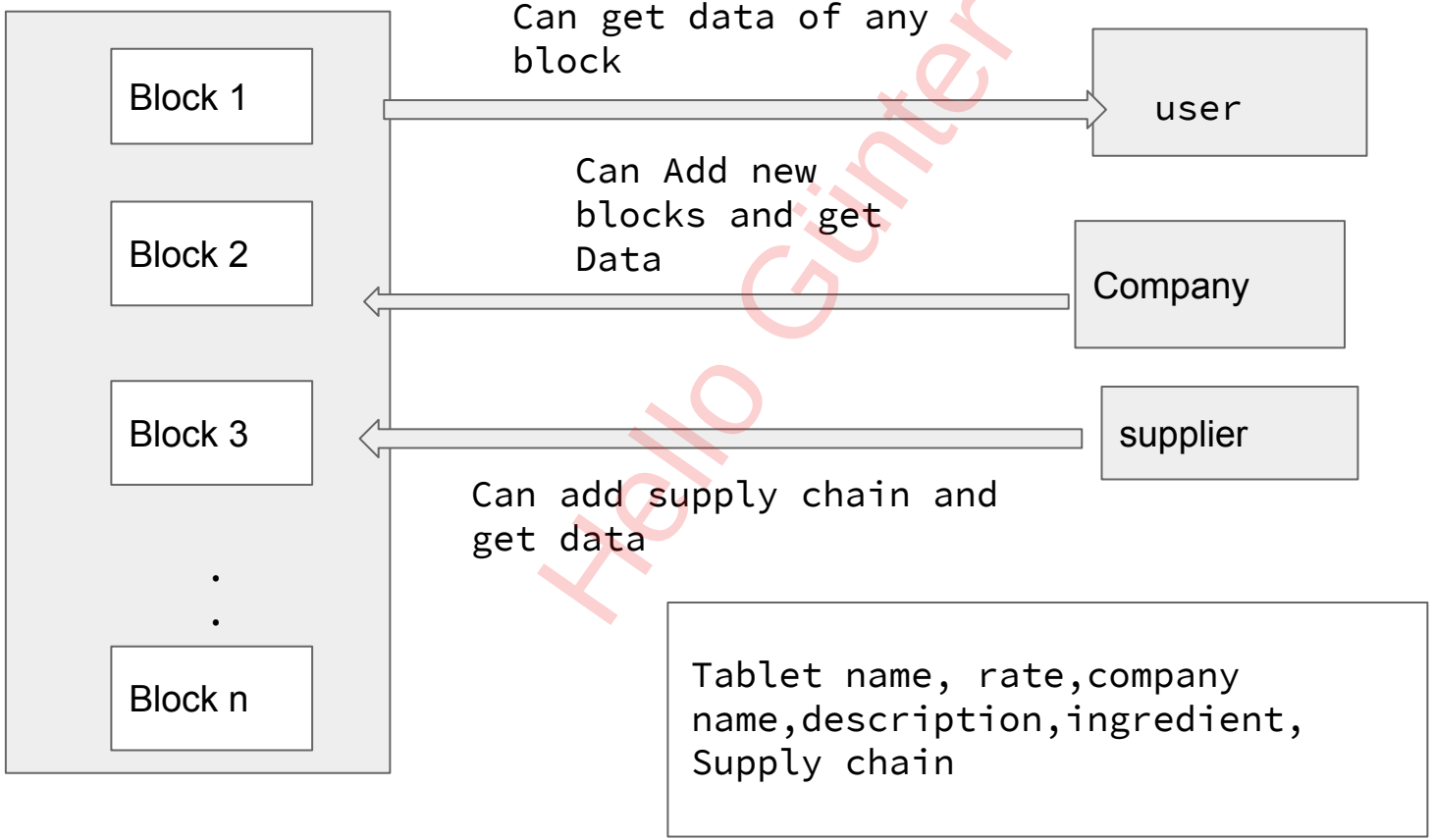

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