

# ENTERPRISE BLOCKCHAINS FUNDAMENTALS



**101 Blockchains**

# YOUR TRAINER

This course is led by industry experts who will share their knowledge and experience with you



## **Enrico Camerinelli**

Enrico is a globally renowned expert of supply chain finance and blockchain, whose current area of focus is on global transaction banking, supply chain finance, blockchain and corporate treasury systems.

# THIS COURSE IS FOR YOU IF WANT TO:



Learn how Blockchain works



Familiarize with Blockchain Definitions



Understand what makes Smart Contracts  
so “smart”



Learn how to build your Enterprise  
Blockchain career

# ENTERPRISE BLOCKCHAINS FUNDAMENTALS

- **LESSON 1: What exactly is Blockchain Technology**
- **LESSON 2: Must know (Enterprise) Blockchain Terms**
- **LESSON 3: Smart Contracts Basics**
- **LESSON 4: Blockchain Digital Transformation**

# WHO SHOULD TAKE THIS COURSE?

- Senior Leadership & Decision Makers
- Software developers and startups
- Innovation Managers & Entrepreneurs
- Advisors & Business Analysts

# LESSON 1

## ENTERPRISE BLOCKCHAINS FUNDAMENTALS



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# ABC of Blockchain: Quick definition of blockchain

- Think of blockchain as a “special” database.
- In blockchain the data is unique and immutable forever.
- And without the need of a central control entity.

# ABC of Blockchain: What can you do with it?

Let's use an example:

I am a supplier that delivered goods to a client.

To get paid I send a letter to the client asking for the due (es. \$100).





# ABC of Blockchain: What can you do with it?

Question: How do I know if (and when) the letter has been delivered?

Answer: Ask the client!

Question: What if I don't trust what my client says?

Answer: Ask the post office!

Question: I don't want an intermediary. No other options are possible?

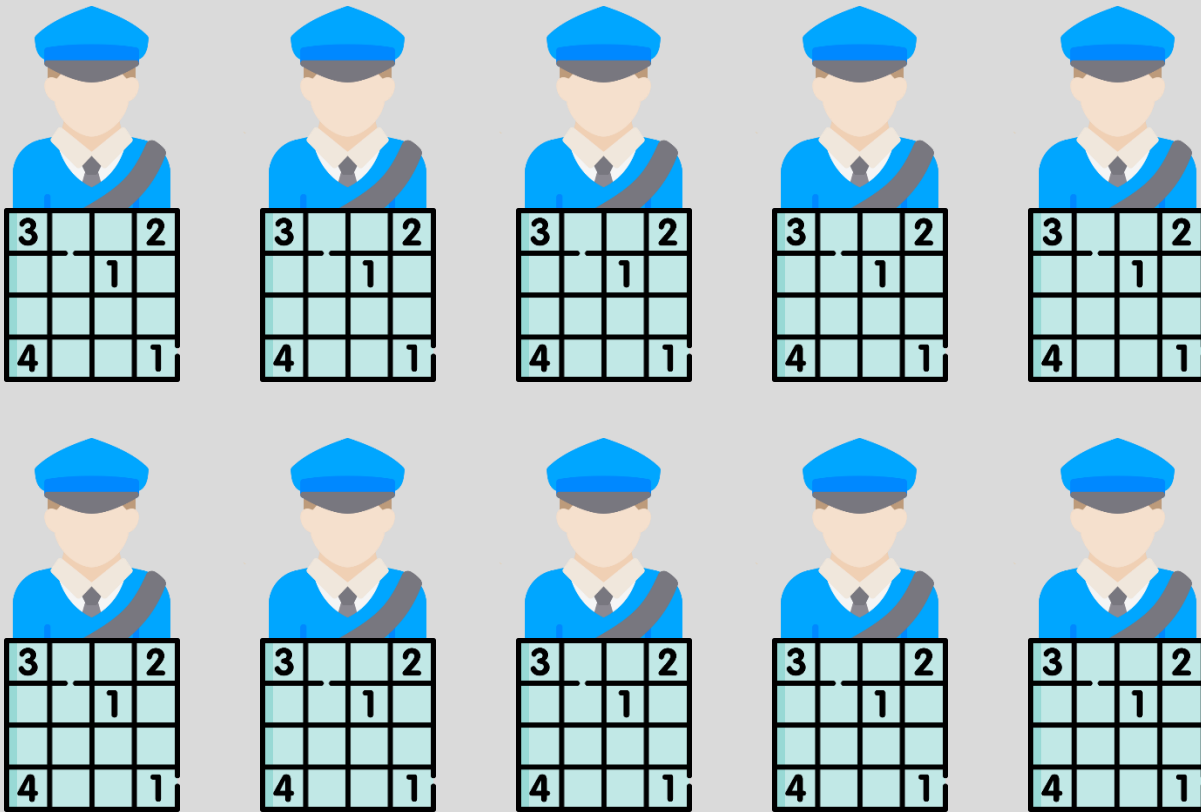
Answer: You can ask directly to the mail carrier!

# Which mail carrier should I ask?

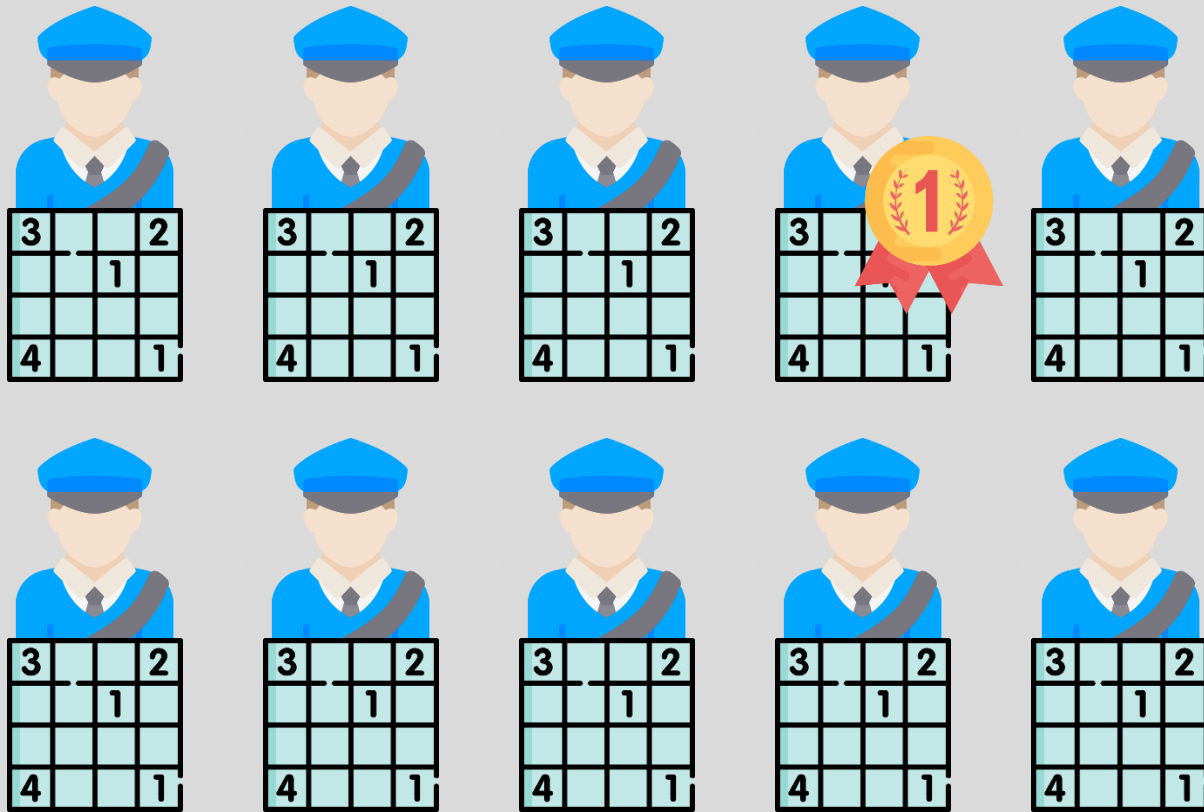
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# How to get the information WITHOUT asking the post office?

Solution: The mail carriers compete to decide who will make the delivery.



# Eventually someone will resolve the Sudoku



**The winner makes the delivery.**

# The winner makes the delivery



And writes the data of the delivery on his registry.

# Copy of the registry is given to all the other mail carriers



# Question: Which mail carrier can I ask?



Answer: Ask any mail carrier!

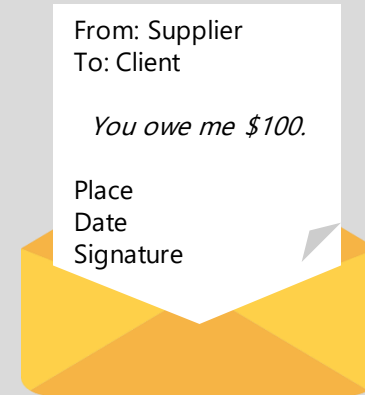
# So is everything set?

---



# So is everything set?

Not really. What happens if against my original letter...



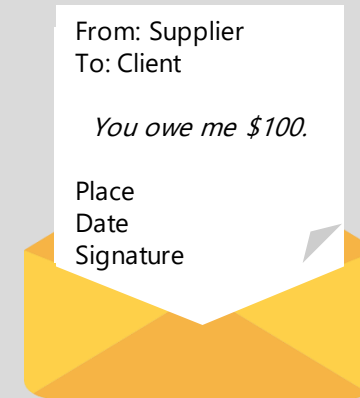
... the client presents a different letter?  
(warning: the client has maliciously altered the information...)



As of today, I must ask (again) an intermediary to fix the issue.

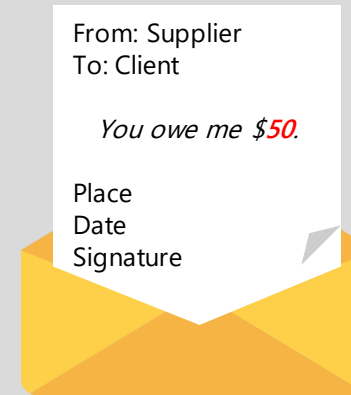
# The solution

The original letter is assigned a «special» code



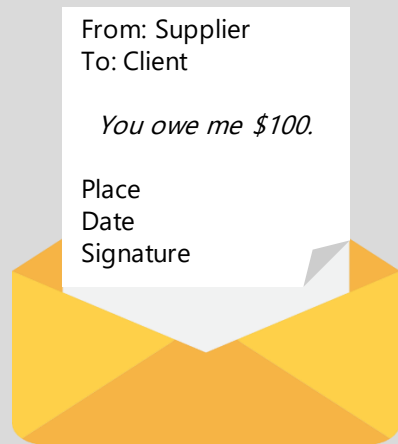
**Cf23df207d99a74fbe169K3e5a035e633b65d94**

The malicious letter is assigned a different «special» code



**Ar03vt\$97de9a7sfbr257f3r8b099e824w£5a18**

The winner mail carrier delivers the letter with the Cf23df207d99a74fbe169K3e5a035e633b65d94 code



## SENDER RECEIVER STAMPING

Cf23df207d99a74fbe169K3e5a035e633b65d94



## CLIENT



Cf23df207d99a74fbe169K3e5a035e633b65d94

# All mail carriers have now a copy of the letter with the code Cf23df207d99a74fbe169K3e5a035e633b65d94



They match

Cf23df207d99a74fbe169K3e5a035e633b65d94

with

Ar03vt\$97de9a7sfbr? 3r8b099e824w£5a18



The «mail carriers system» acknowledges the original as the  
valid letter

# End of LESSON 1

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# LESSON 2

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# Must know (Enterprise) Blockchain Terms

- **Blockchain:** decentralized distributed ledger that allows peer-to-peer (p2p) transactions secured by cryptographic algorithms and consensus mechanisms.
- **Consensus mechanism:** a way to ensure that the transaction is valid without the need for a central authority, and that there is no double-spending.
- **Valid transaction:** parties are certain that the exchange has happened and cannot be neglected.
- **Double-spending:** the possibility for one party to 'copy-and-paste' and 're-use' an electronic transaction (e.g., payment).
- **Miners/ validators:** network participants dedicated to validating transactions and avoiding double-spending.
- **Bitcoin:** cryptocurrency that runs on blockchain.
- **Cryptocurrency:** a digital token exchanged on blockchain using cryptographic algorithms to secure the p2p transaction.
- **Token:** the digital representation of a 'unit of possession' that can be exchanged between parties.
- **Permissionless blockchain:** blockchain protocol that allows anyone to join the network.
- **Permissioned blockchain:** blockchain protocol that requires authorization to join the network.
- **Smart contract:** software program that- when triggered- automatically executes instructions to transfer tokens.

# End of LESSON 2

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# LESSON 3

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# Smart Contracts



SUPPLIER



CLIENT

## CONTRACT

Between  
Supplier and Client

*When goods arrive and are accepted, receive  
and pay invoice of 100 euros.*

*Signed Supplier*

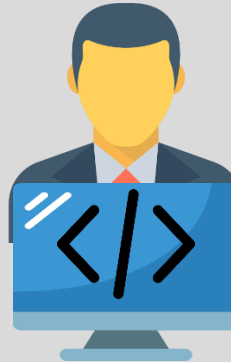
*Signed Client*



# Smart Contracts



SUPPLIER



CLIENT

```
contract Token {
    mapping(address => uint256) balances;
    using Balances for *;
    mapping(address => mapping (address => uint256)) allowed;

    event Transfer(address from, address to, uint amount);
    event Approval(address owner, address spender, uint amount);

    function balanceOf(address tokenOwner) public view returns (uint balance) {
        return balances[tokenOwner];
    }
    function transfer(address to, uint amount) public returns (bool success) {
        balances.move(msg.sender, to, amount);
        emit Transfer(msg.sender, to, amount);
        return true;
    }
}
```

Source: <https://solidity.readthedocs.io/en/latest/solidity-by-example.html>

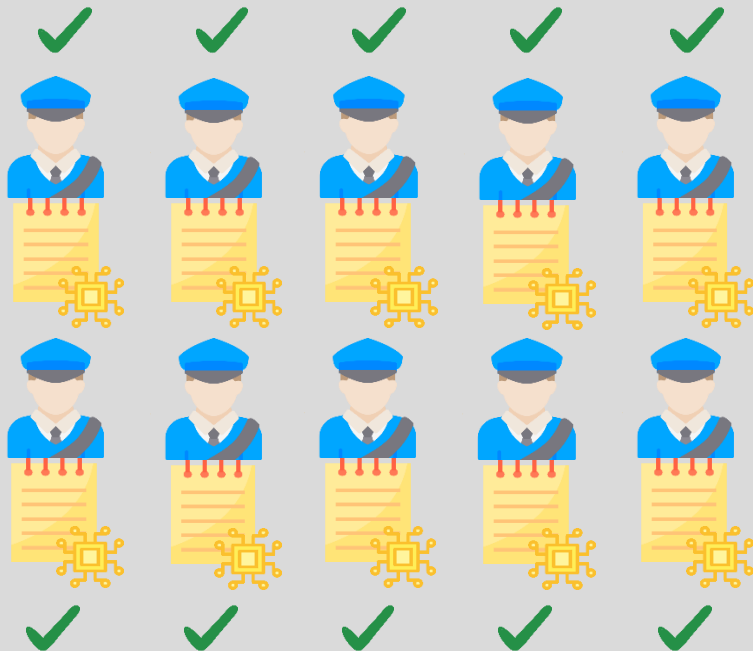
# Smart Contracts



SUPPLIER



CLIENT



```
contract Token {  
    mapping(address => uint256) balances;  
    using Balances for *;  
    mapping(address => mapping (address => uint256)) allowed;  
  
    event Transfer(address from, address to, uint amount);  
    event Approval(address owner, address spender, uint amount);  
  
    function balanceOf(address tokenOwner) public view returns (uint balance) {  
        return balances[tokenOwner];  
    }  
    function transfer(address to, uint amount) public returns (bool success) {  
        balances.move(msg.sender, to, amount);  
        emit Transfer(msg.sender, to, amount);  
        return true;  
    }  
}
```



Source: <https://solidity.readthedocs.io/en/latest/solidity-by-example.html>

# End of LESSON 3

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# LESSON 4

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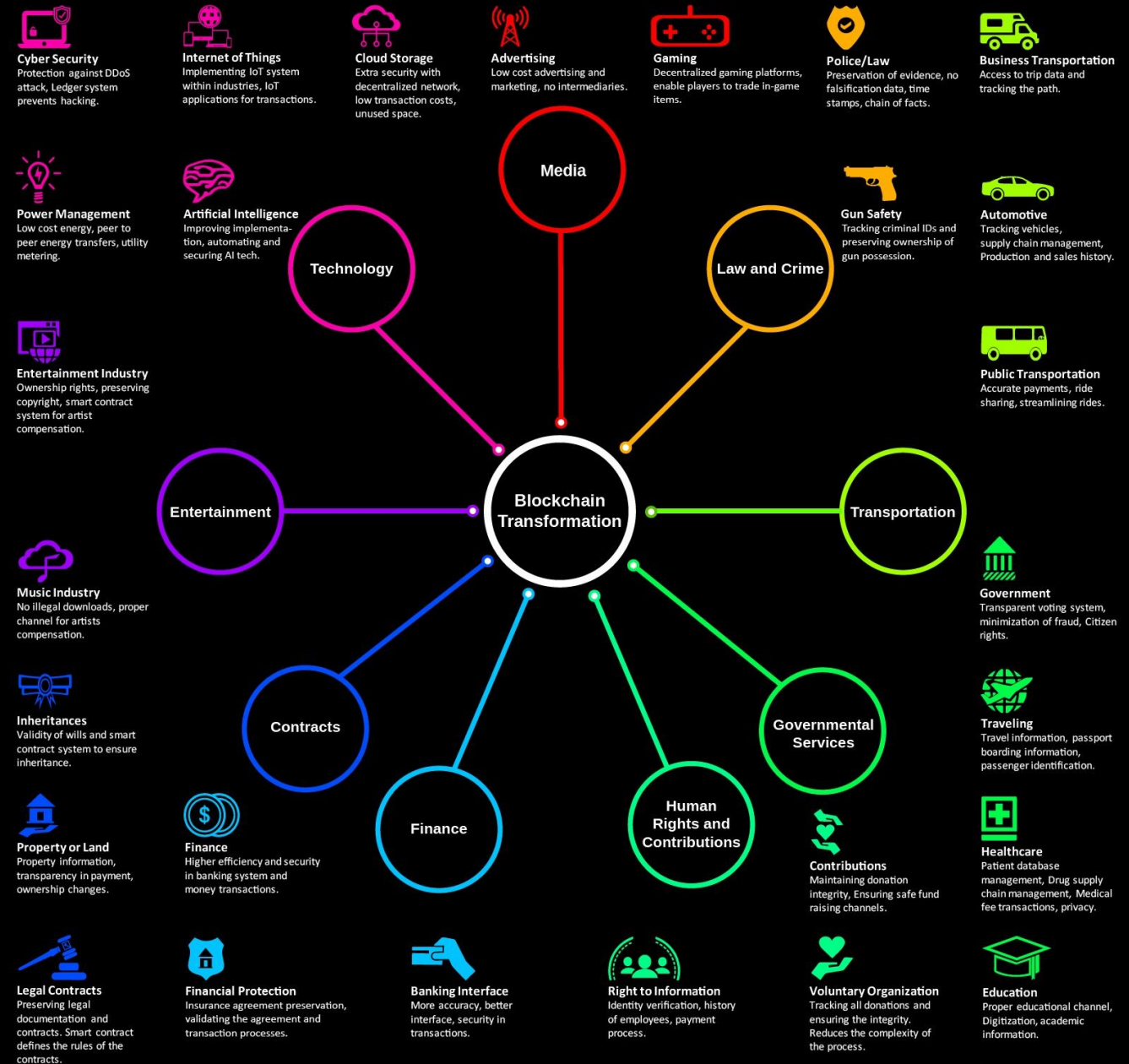


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# 9 Verticals of Blockchain Transformation

1. Technology
2. Media
3. Law and Crime
4. Transportation
5. Governmental Services
6. Human Rights
7. Finance
8. Contracts
9. Entertainment

## Blockchain Digital Transformation



# 2020 Leading Sectors

- ✓ Supply Chains
- ✓ Fintech
- ✓ Retail
- ✓ Trading
- ✓ Mining
- ✓ Healthcare
- ✓ Insurance

and more ....

## Enterprises Which Are Implementing Blockchain Technology



**Apple**  
Patented blockchain technology for time stamping data.



**Facebook**  
Exploring the use of blockchain to enhance data security and users privacy.



**Google**  
Exploring the use of blockchain technology to enhance cloud service security and for data protection.



**Baidu**  
Using blockchain to enhance intellectual rights management.



**Ford**  
Leveraging blockchain technology to enhance the mobility of technologies.

**Tencent 腾讯**

**Tencent**  
A Solution for verifying invoice authenticity and for ensuring tax compliance.



**Alibaba Group**  
Using blockchain technology to track luxury goods in its e-commerce platforms.



**Prudential**  
Unveils a blockchain powered trading platform for small and medium-sized enterprises.



**BHP Billiton**  
Leveraging blockchain technology for supply chains management.



**FedEx**  
Working on blockchain solution for settling customer disputes.



**Nestle**  
Using blockchain technology in supply management to track baby food products.



**Maersk**  
Blockchain system for tracking movement of shipments between ports.



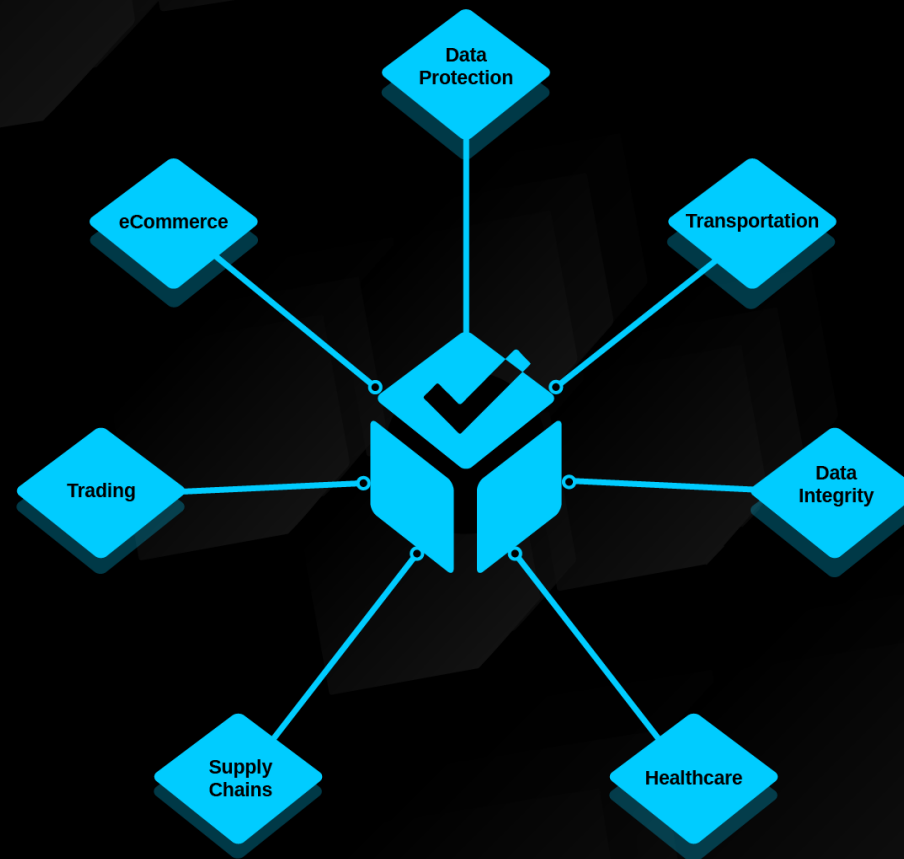
**UPS**  
Blockchain powered logistics monitoring and management solution.



**Samsung**  
Intends to use blockchain technology to enhance supply chain management when it comes to electronics shipments.



**Walmart**  
Using blockchain technology to track product movement from farmers to stores.



**Toyota**  
Planning to use blockchain technology to enhance autonomous driving technology.



**British Airways**  
Implementing blockchain to manage flight data as well as verifying travelers identity.



**AIA Group**  
Launched the first of its kind bancassurance for sharing policy data.



**UnitedHealthcare**  
Using blockchain technology to improve doctors directories to enable accurate insurance claim fillings.



**MetLife**  
Using blockchain technology for storing patients medical records for insurance purposes.



# End of LESSON 4

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# BONUS & NEXT STEPS

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# Bonus #1

## Blockchain vs Database

- Authority
- Integrity
- Write Access
- Cost
- Speed
- Trust

### Is Database Enough? A comparison Between Blockchain and Database

No one has the central authority.



Selected groups of individuals have authoritative control.

Modifying data or asset is nearly impossible.



Data or assets can be easily changed.

All the data or activity is out in the open for everyone to see.



All the data or transactions are hidden from each other.

Cuts down the excessive costing.



Implementing process is costly.

Blockchains are slow.



Databases are comparatively faster.

Suited for an organization where users don't trust each other.



Suited for an organization where there is mutual trust.

# Bonus #2

## Enterprise Blockchains

### BaaS Vendors:

- IBM
- ORACLE
- AWS
- ALIBABA
- ACCENTURE

### Enterprise Platforms:

- Fabric
- Corda
- EEA
- Quorum
- Ripple



# NEXT STEPS

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# CERTIFIED ENTERPRISE BLOCKCHAIN PROFESSIONAL



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# CERTIFIED ENTERPRISE BLOCKCHAIN PROFESSIONAL



- Module 1: Blockchain Technology Fundamentals
- Module 2: Enterprise Blockchain Platforms
- Module 3: Blockchain in Trade Finance
- Module 4: Blockchain Applications
- Module 5: Blockchain Use Cases

# ARE YOU READY TO JOIN THE BLOCKCHAIN REVOLUTION?

- ✉ [contact@101blockchains.com](mailto:contact@101blockchains.com)
- in [linkedin.com/company/101blockchains](https://www.linkedin.com/company/101blockchains)
- 🐦 [twitter.com/101blockchains](https://twitter.com/101blockchains)



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