Why use blockchain (a chain) instead of just a traditional database + role-based access?

Traditional systems can control *who* can do *what*, but they can’t prove *what was done*, *by whom*, *when*, and *that it was never tampered with*.  
Blockchain gives us **tamper-proof, decentralized, cryptographically signed audit trails** — databases can’t.

1. **Immutability & Tamper-Proof Records**

* On a database, even with role-based access, admins or insiders can:
  + Delete or rewrite records
  + Change timestamps
  + Cover up fraud
* On blockchain:
  + Every cargo action is an immutable event
  + No one can go back and fake a delivery or erase a mistake

1. **Decentralized Trust**

This is especially important in **supply chain**, **compliance**, **regulatory audits**, and **legal liability**.

* In a traditional DB, **you must trust the owner of the server** (e.g., the logistics company)
* In blockchain:
  + No single party controls the data
  + Participants (owners, drivers, inspectors) can independently verify history

Useful for **multi-party ecosystems** (freight carriers, customs, insurers)

1. **Proof of Accountability**

* Each update (status change, lock, registration) is tied to:
  + **The sender’s wallet address**
  + A **timestamp**
  + **Cryptographic proof** (signature)
* This is not possible in a centralized DB unless you bolt on lots of extra tech

1. **Composability & Interoperability**

* Smart contracts can trigger external actions:
  + Payments (e.g., unlock funds when cargo is delivered)
  + Chainlink oracles (e.g., verify customs cleared)
* Integrating a DB into those chains is far more complex

1. **Public Verifiability (if needed)**

* Anyone can query the cargo trail without privileged access
* No login required — just read from the chain