# BUSIESS REQUIREMENT

Our Vacchain allows users (USERs) to track and trace the route of vaccines. We propose three mechanisms, namely, a system manager (SYS-MAN), a mutual agreement concerning vaccine ownership, and vaccine passports, to enhance the security and reliability of data recorded in the Vacchain ledger. We develop this system on the Substrate platform with the Rust language. Our implementation, evaluation, and analysis have shown that Vacchain can trace and track vaccines smoothly. In addition, data security and reliability are enhanced by the abovementioned three mechanisms.

The business requirements for the Vaccine Tracking Smart Contract on Ethereum Block chain include the establishment of a decentralized ledger for vaccine supply chains. This ledger should enable real-time recording and tracking of vaccine shipments, with each transaction being securely and immutably stored. Additionally, the system should provide visibility to all authorized stakeholders, ensuring transparency and traceability while protecting sensitive data through encryption and access controls.

**Vacchain**

**SYS-MAN**

SYS-MAN
- approve_role()
- register_vac_type()

**VM**

VM
- register_vac_info()
- transfer_vaccine()
- receive_vaccine()

**VAD**

transfer_vaccination_right()

VAD

**VAO**

VAO
- approve_vaccine()

**USER**

USER
- confirm_vaccine()
- register_vaccine_pass()

ALL
- claim_role()