ERP-BLOCKCHAIN INTEGRATION

This document contains a brief high level overview integrating blockchains with the conventional ERP systems (SAP, Oracle, etc).

For the given use case :
1. **Blockchain Platform** - Quorum
2. **ERP System** - SAP (Warehouse Management component and Transportation Management Component)

The conventional system of logistics and transportation involves usage of different ERP systems at all the involved party ends. This leads to data mismatching and other related issues. To solve this issue, a common and decentralised platform is to be integrated with the different ERP systems at different ends.
For this matter, any blockchain platform can be used as the common platform for data storage and validation.
The decentralisation in the platform involves building up the mutual trust on blockchain and hence data validation becomes easier and faster.

Flow Architecture

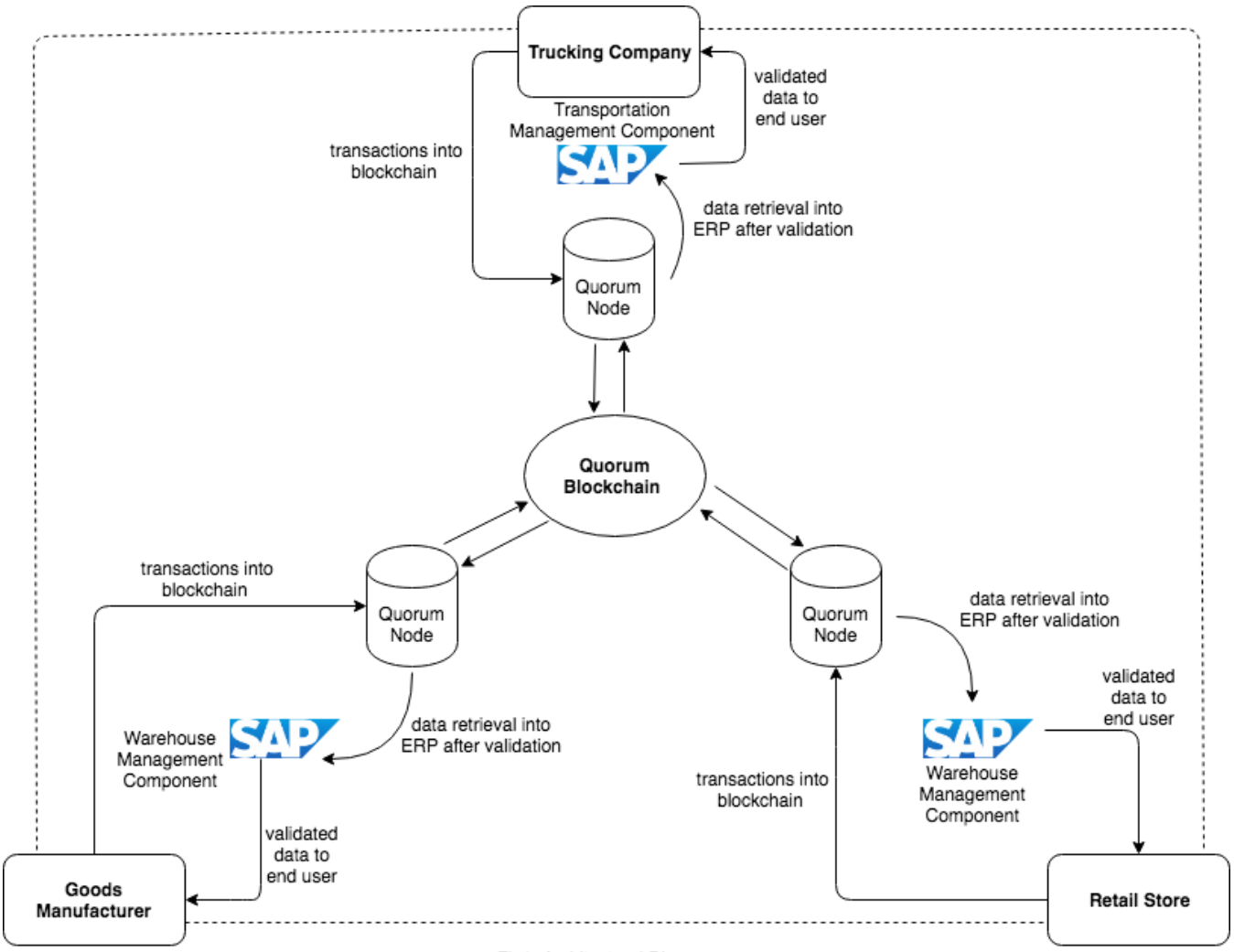
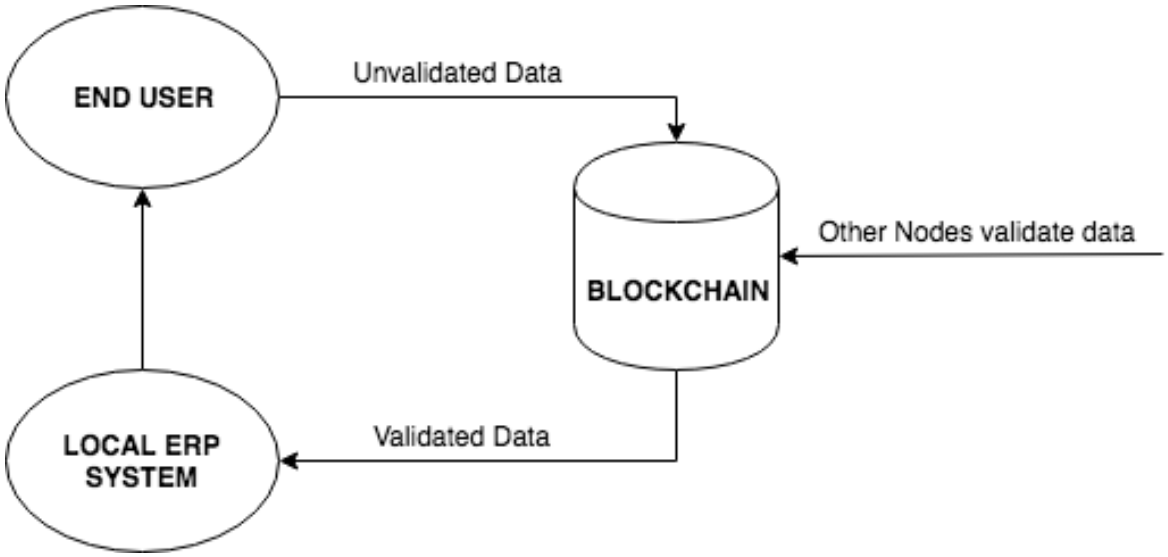


Fig1. Architectural Diagram

Major components

1. **Actors** : Manufacturer, trucking company, retailer
2. **ERP systems** : for simplicity i have assumed SAP ECC Transportation Component for the trucking company and SAP ECC Warehouse Management for manufacturer and retailer.
3. **Blockchain Nodes** : A separate node is spun off for each party ensuring distinguishable transactions.
4. **Blockchain Platform** : any blockchain platform can be chosen for ensuring decentralisation and transparency. Here, considering quorum's added benefits over ethereum blockchain, i have chosen Quorum to be the blockchain platform.

Data Flow



1. Retailer issues lot order to manufacturer.
2. Manufacturer processes the order.
3. Truck arrives at manufacturer's warehouse and transacts the inbound check-in time directly into the blockchain using Blockchain APIs.
4. The manufacturer now validates and approves this inbound check-in time into the blockchain(any 2 factor authentication such as OTP verification can be used for validation as well).
5. This validated check-in time is fetched from the blockchain to the local ERPs of manufacturer and trucking company.
6. The truck loads the goods and logs the check-out time into the blockchain.
7. The manufacturer validates this inbound check-out time now into the blockchain network and the same is fetched into the local ERP systems.
8. The same procedure goes on for the outbound check-ins and check-outs at the retailer's end.
9. Any discrepancy resolution can be done by verifying the immutable transactions and their timestamps from the blockchain.

Hence, the entire data for a particular logistics transportation cycle is written and validated over the blockchain and is purely immutable and secure.