HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY

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APPLICATION OF BLOCKCHAIN FOR VERIFICATION OF PRODUCTS' ORIGIN

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INTRODUCTION

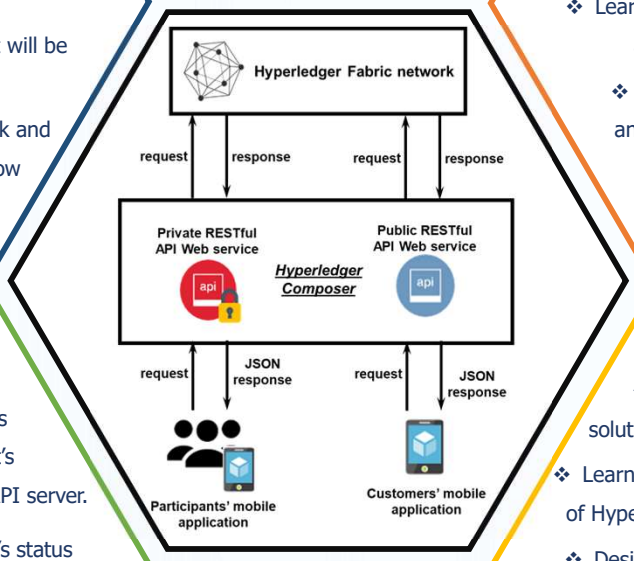
- Agrifood with unknown origin has been a popular and serious problem in the modern society of Vietnam.
- Some methods are implemented to verify agricultural products' origin, but most of them rely on a database that can be altered for harmful purposes.
- Blockchain is more secure because the data can't be altered as it is stored using advanced cryptographic techniques.
- In this thesis, we will use Blockchain to implement a way to verify agricultural products' origin.

OBJECTIVES

- Understand the characteristics and operational methods of Blockchain.
- Design a procedure that applies Blockchain and can be used to trace back the supply chain for an agricultural product.
- Research and select technologies that will be used to create a demonstration.
- Implement a demo business network and supply chain to know more about how a Blockchain network works.

METHOD

- Study about the fraudulence in agrifood products' origin in Vietnam and the need for a solution.
- Take a view of related works around the world.
- Learn about agricultural products' supply chain and basis of Blockchain technology.
- Use Hyperledger Composer to design and implement a blockchain network to help to clarify agricultural products' supply chain.



ARCHITECTURE

- Participants' mobile app submits transactions that indicate a product's status via POST requests to private REST API server.
- Customers' mobile app gets a product's status via GET requests to a public REST API server.
- Both REST API servers are generated by Hyperledger Composer and interact with the Hyperledger Fabric blockchain network to get/set data.

ACHIEVEMENTS

- Understood the social need for a solution to clarify and verify agrifood's origin.
- Learned the basis of Blockchain and the concepts of Hyperledger Fabric and Hyperledger Composer.
- Designed a procedure to apply Blockchain onto the supply chain for a specific type of agrifood.
- Implemented a demo Blockchain network and applications so that the supply chain members and end-users can interact with the network through the exposed RESTful APIs.

CONCLUSIONS

- Blockchain helps clarify information in the supply chain, protect the reputation of the involved parties and increase customers' trust about products' origin.
- However, it is new in Vietnam and might not be supported by all organizations in the supply chain.
- Hyperledger Fabric is hard to use, and support for Hyperledger Composer is limited.