

Background :

- **Food safety is an important issue in all countries, especially in the developing ones such as Vietnam, Indonesia, and Philippines where their living standard is still not high.**
- **Increasing number of people concerns carbon dioxide emission from food that they are eating every day.**
- **It is not easy to export agricultural products to developed countries where food safety standard is relatively high, and the trusted origin of food is required.**

Targets:

We propose a blockchain-based network, namely AgriBKChain, to solve challenges of trusted traceability and advertising for agricultural products. Two objectives of project:

- **Providing trusted information of origin and culture of agricultural products, such as location identification, production diary, harvesting and storing processes**
- **Connecting to existing networks in Japan, Europe, and US for product advertising and export. For example, blockchain-based EXA network in Fukuoka**

Speaker:

Dao Thanh Chung Ph.D., Hanoi University of Science and Technology

Project Members :

- 1. Dao Thanh Chung (HUST), leader**
- 2. Nguyen Binh Minh (HUST)**
- 3. Do Ba Lam (HUST)**
- 4. Mohd Fadlee A.Rasid (UPM)**
- 5. Zuriati Ahmad Zukarnain (UPM)**
- 6. Beston Nore (UTB)**
- 7. Syazana binti Abdullah Lim (UTB)**
- 8. Fumihide Kojima (NICT)**
- 9. Kentaro Ishizu (NICT)**

Project Duration :

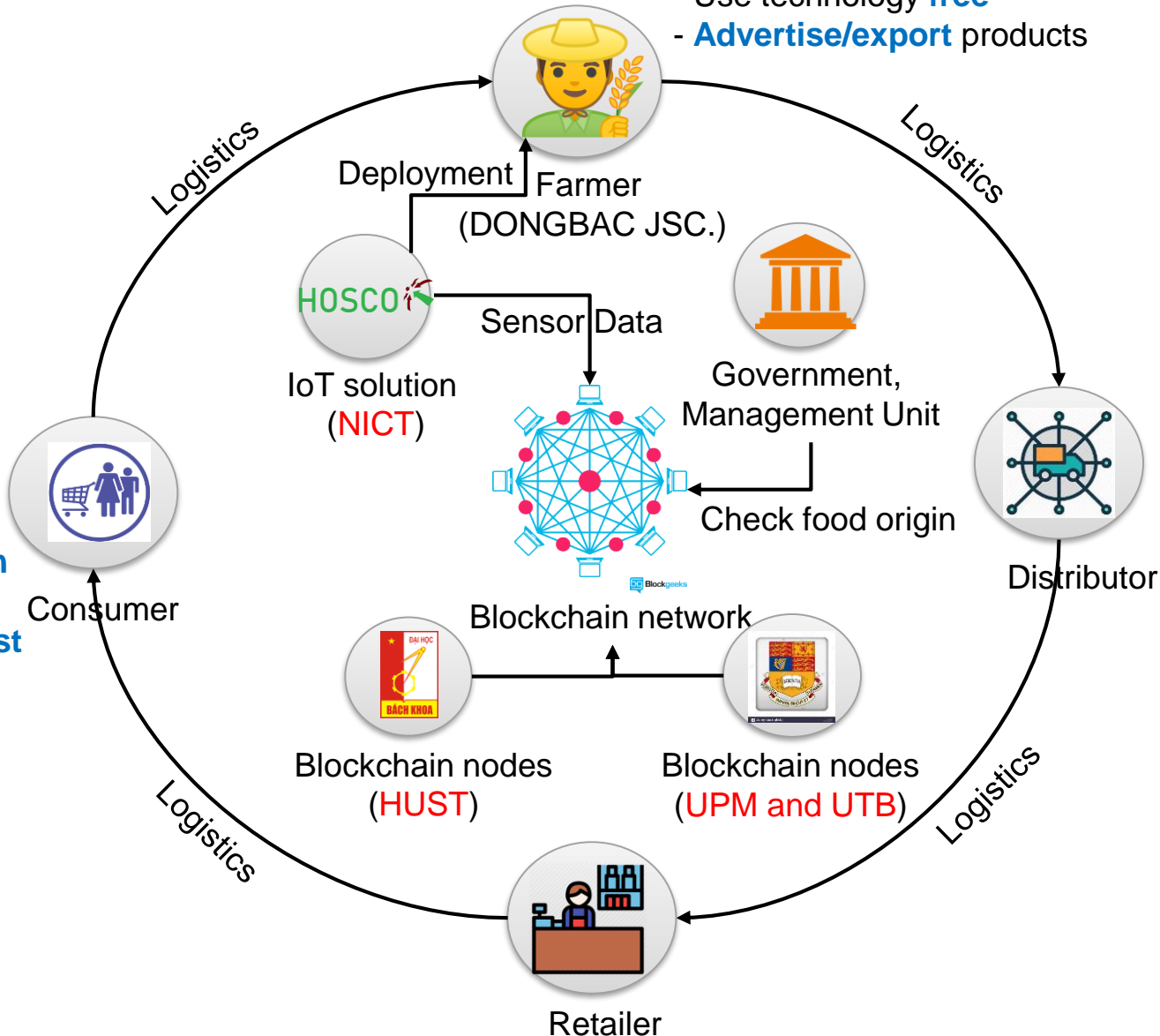
Two years (from April 1st 2019)

- Providing trusted information about
 - Origin: location, production diary
 - Culture of agricultural products: harvesting processes, and how to serve
- Connecting to Japan, Europe, and US for product advertising and export
 - Exa network: at Fukuoka, Japan (<http://kurateblockchainvillage.jp/>)
 - Te-Food network: at Germany (<https://ico.tefoodint.com/>)

Our proposed AgriBKChain's advantages

- Record **production diary** easily
- Use technology **free**
- **Advertise/export** products

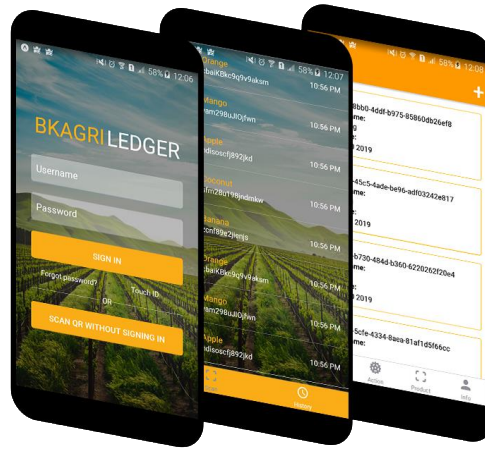
- Trace **trusted information**
- Check **carbon footprint**
- Feedback and evaluate **fast**



- Provide trusted and immutable information
- Provide convenient interfaces for users including farmers, producers, distributors, and consumers
- Provide export channel of agricultural products
 - By connecting to other blockchain networks in Japan and Germany
 - To advertise products from our network

- Developed to run under V-Chain platform
 - Play a role as a blockchain engine (AgriBKChain engine)
 - Based on Hyperledger Sawtooth among partners
 - Manged by our project's partners
- V-Chain is platform for blockchainization
 - Developed by HUST
 - Enable application developers to create in-an-easy-way their decentralized applications
 - Support multiple blockchain engines
 - Hyperledger Sawtooth
 - Hyperledger Fabric

- Based on b-Agri
 - <https://v-chain.vn/solutions/b-agri>



- AgriBKChain interface
 - Could be used for many products
 - Convenient interface on web, mobile, and tablet

- Testbed is required
 - To deploy IoT devices
 - To get real data
 - Temperature
 - Humidity
 - pH
 - Image and video
 - To evaluate AgriBKChain performance
- Testbed is expected to be built at farms in
 - Vietnam
 - Malaysia
 - Brunei
 - NICT (if possible)



Water level sensors

CO2 sensors

Temperature sensors

Farms using portable environmental sensing (wireless grid) from NICT equipping low-energy devices

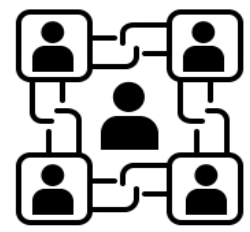


Outdoor Wi-fi station

Indoor cucumber farm in Brunei



Mau-Son shiitake mushroom

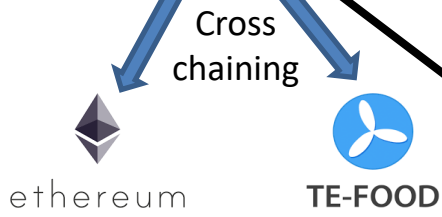


AgriBKChain Blockchain



SunSpot base station

Indoor lettuce farm in Malaysia



ethereum

TE-FOOD

AgriBKChain Deployment

<https://delcofarm.thingxyz.net/qrc?qr=BENIYDCG314>

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- Our paper is in review
 - An Architecture Prototype of Certificate Authentication System Using Blockchain in Vietnam, Peerj journal (HUST)
 - The above paper's network architecture will be applied to AgriBKChain

- Create a blockchain network among Asian countries
 - To record agricultural information from farmers and distributors
 - To provide trusted information to consumers
 - To increase the security of the blockchain network
- Export agricultural products to developed countries, such as Japan, US, and Europe
 - Consumers can trace food origin easily from our blockchain network

- Challenges
 - Providing trusted information
 - Connecting to Japan, Europe, and US for product advertising and export
- AgriBKChain is deployed among partners
 - Provide trusted and immutable information
 - Provide convenient interfaces for users
 - Provide export channel of agricultural products
- Testbed is expected to be built at farms in
 - Vietnam, Malaysia, Brunei, NICT (if possible)
- Next meeting
 - 3/2022 (Brunei)
 - Organize a small workshop
 - Help UTB make a blockchain node