Bohnanza!

Challenge posed:
How can Blockchain help ensure full traceability of organic-certified soybeans produced in Ukraine and transported to Switzerland?

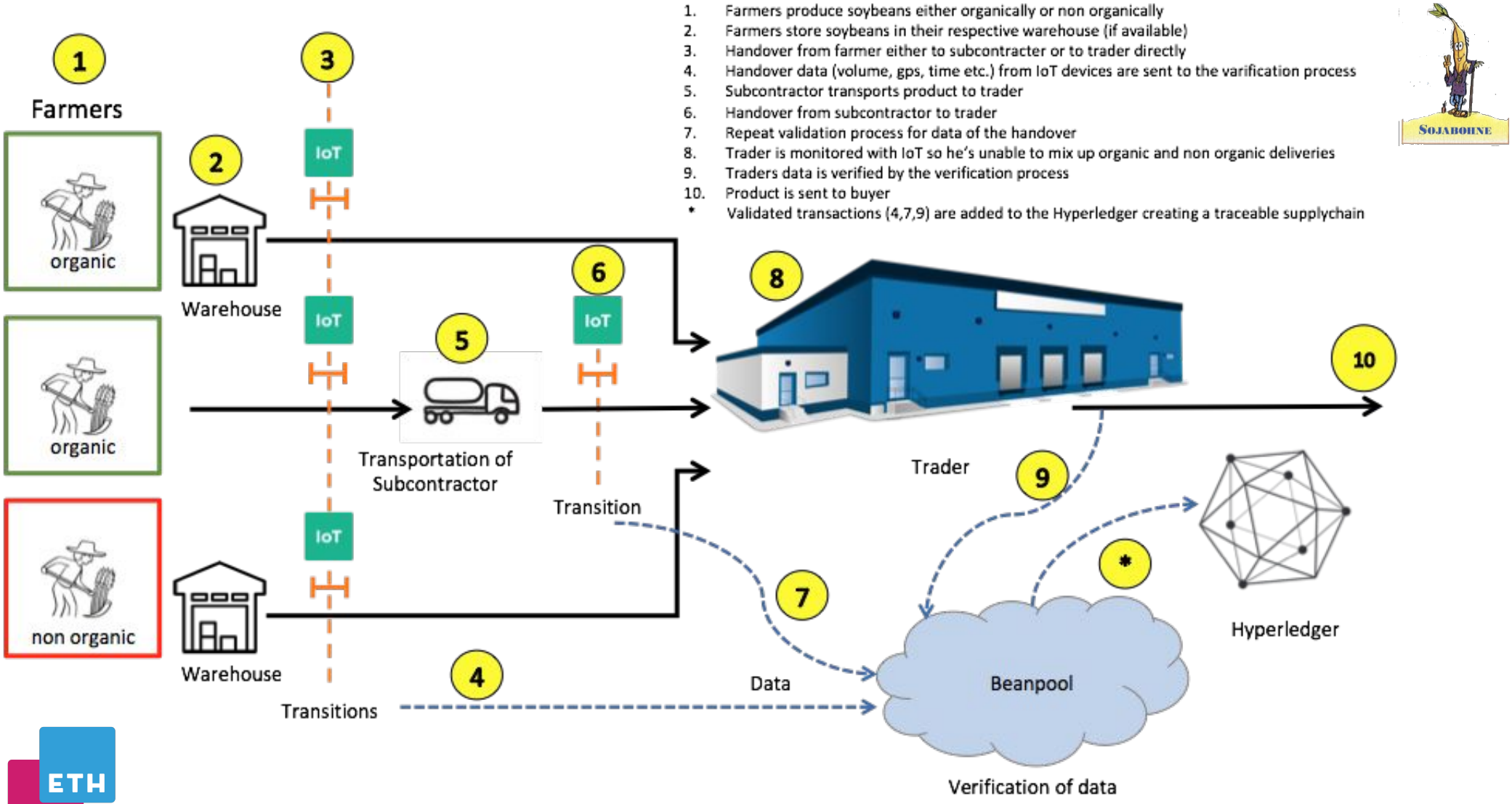
Status Quo:
Current supply chains lack transparency and are vulnerable to fraud.

After implementation of our solutions:
A traceable soybean supply chain using a hyperledger whose entries are verified by a unique process. This ensures a trustworthy system with low incentives to cheat and high barriers for fraud.

Work in progress:
Failed Raspberry Pi connection to local wifi to get GPS data . Verification process with mempool not implemented due to lack of time. Potentially the system is too cumbersome to join for low budgeted farmers. The security of our system depends heavily on the security of IoTs in general, so in theory the system can be fooled.

ETH B PETERSON CONTROLUNION

Sascha, Megan, Niko, Felix, Sam, Ingvar



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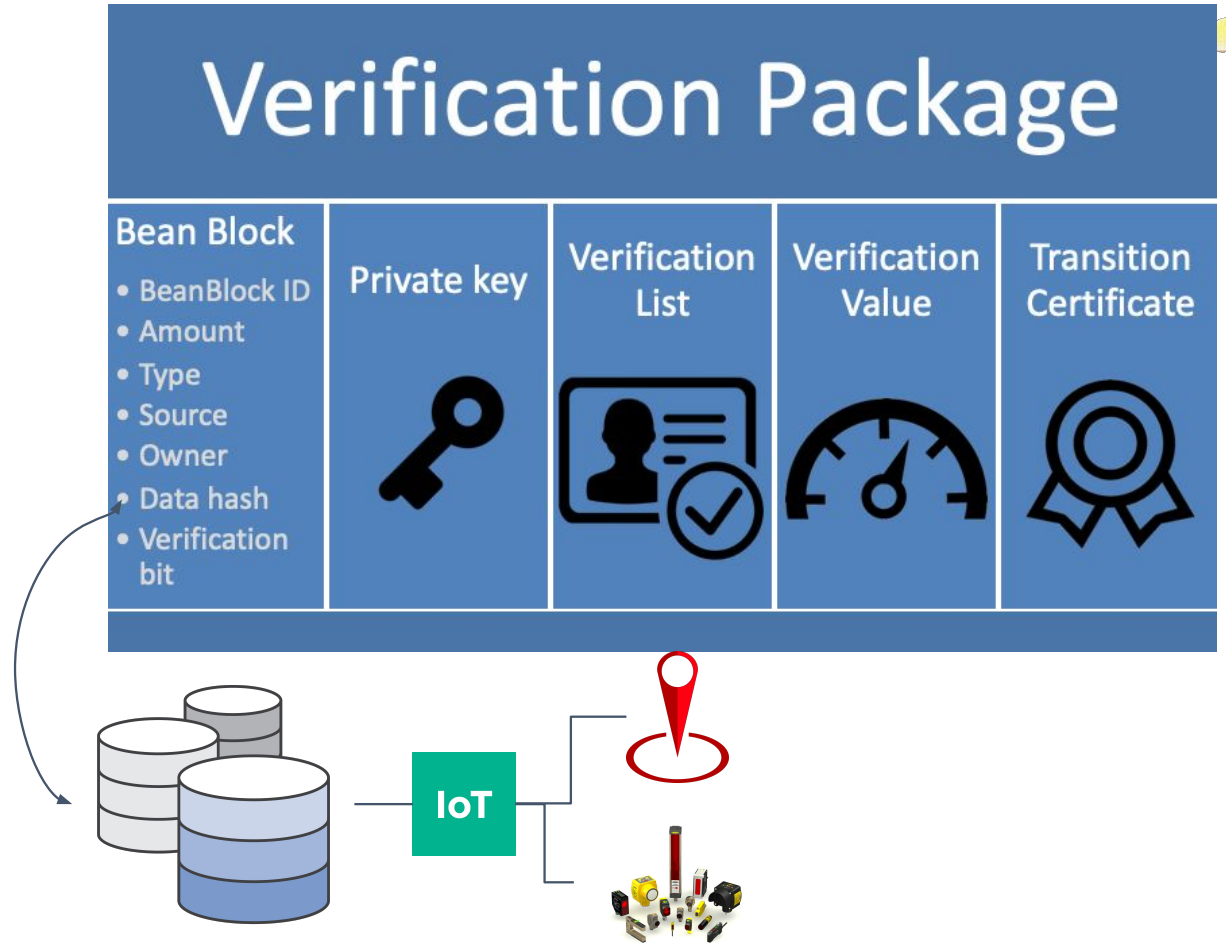
BeanPool Design

1. The Data of the Soya Bean Harvest is saved in a “Bean Block”.
2. The Handler of the Bean Harvest (e.g. Farmer or Trader) encrypts the Bean Block and submits the package to the BeanPool
3. The community verifies Verification Packages at random using the linked IoT Data. Once enough people have verified the Package it leaves the BeanPool. (See report for a more detailed explanation).



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Incentive Design

Every Participant has a reputation, and every VerificationPackage (VP) has a verification value.

For every verification of a VerfificationPackage, it's verificationValue (VV) is updated according to the verifiers reputation. Once a threshold is reached, the VerificationPackage leaves the BeanPool and the BeanBlock can be attached to the Hyperledger. Depending on your Reputation, you gain more voting power in the BeanPool.

- Reputation
  - Awarded for correct verification and for submitting correct BeanBlocks.
  - Represents how trustworthy a Participant is. Thus can also help in the real world for obtaining new Contracts.

When somebody votes on a VP, the VP's VV and the Participant's Reputation is updated accordingly:

	False Positive	False Negative	Positive	Negative
Verification Value	strong penalty	decreases	increases	increases
RepBean	decreases	remains	RepBeanMeter increases	New RepBean

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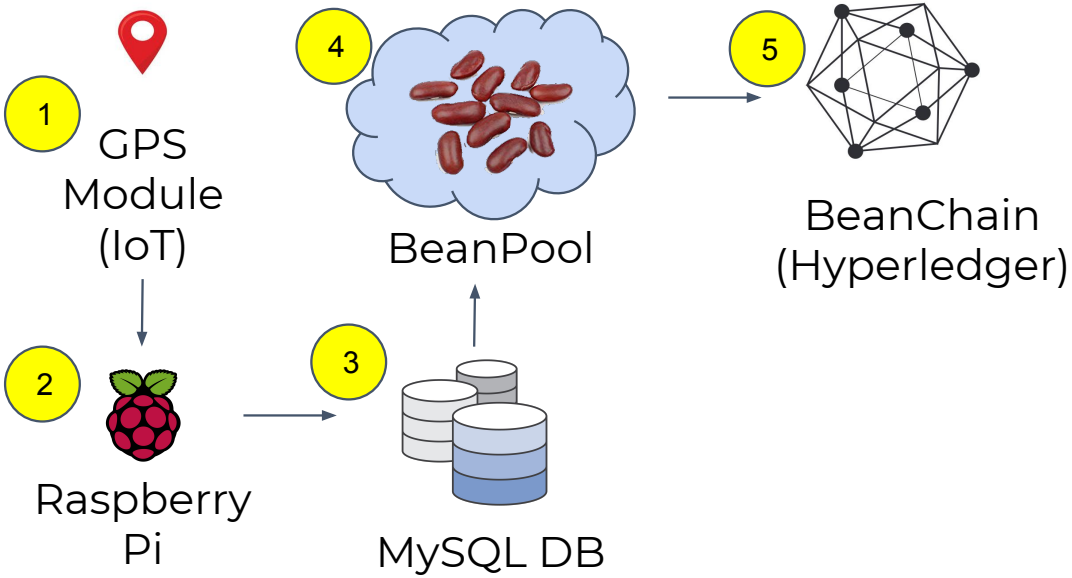
Proof of Concept



1. GPS Module records location and time to a csv file
2. A python script adds the new record to our mysql DB
3. The DB collects all IoT and static data
4. A new BeanBlock is created and submitted to the BeanPool
5. After verification the BeanBlock gets added to the BeanChain

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