# **BLOCKCHAIN**

## AND THE INTERNET OF THINGS

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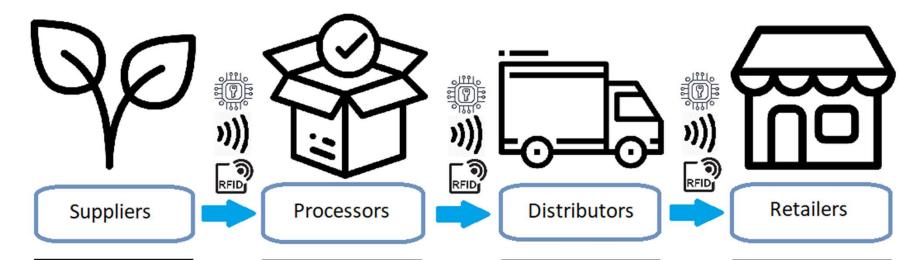
# APPLICATIONS IN AGRICULTURAL SUPPLY CHAINS

# **CONTENTS**

- Applications
- Enabling technologies for IoT
- IoT adoption barriers
- Blockchain
- Blockchain adoption barriers
- Arguments for a Lightweight Trust Model

# **APPLICATIONS**

- DIGITAL TRACEABILITY
- PROACTIVE DECISION-MAKING
- MACHINE LEARNING



### IoT Sensors:

- + Climate Monitoring
- + Crop Monitoring
- + Livestock Monitoring
- + Irrigation Automation

#### IoT Sensors:

- + Temperature
- + Humidity
- + Anti-Tampering
- + Batch Identification
- + Batch Tracking

### IoT Sensors:

- + GPS, LAN, WSN
- + Temperature
- + Humidity
- + Anti-Tampering
- + Delivery Tracking
- + Arrival/Acceptance

#### Data:

+ Unified view

QR Codes on packaging allows viewing data logged in the blockchain from all previous steps.

Integration with regulators allows for rapid identification of recalled products.

# ENABLING TECHNOLOGIES FOR IOT

- WIRELESS CONNECTIVITY (SHORT, MEDIUM, LONG-RANGE)
- DATA PLATFORMS
- RELATION TO BLOCKCHAIN

# IOT ADOPTION BARRIERS

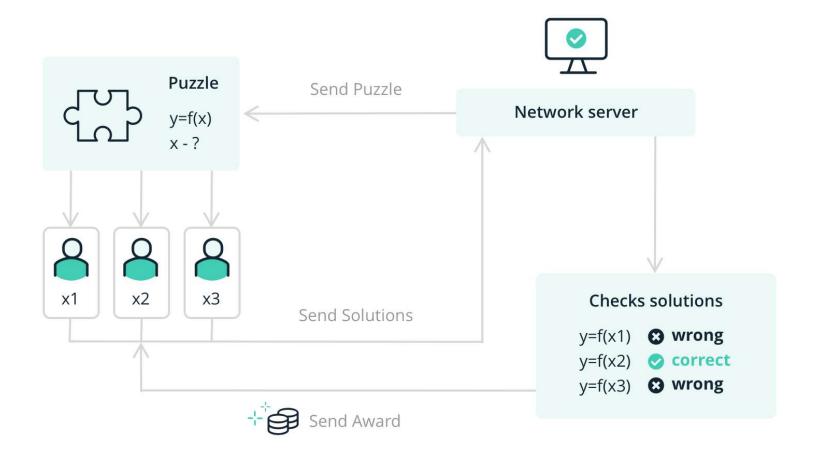
- CONNECTIVITY
- COST (DECREASING)
- SECURITY (PERCEIVED RISK)
- LACK OF INTERNAL EXPERTISE

# **BLOCKCHAIN**

- DISTRIBUTED LEDGER
- PUBLICLY VIEWABLE
- SECURITY
- MODELS OF CONSENSUS

# BLOCKCHAIN ADOPTION BARRIERS

- LACK OF INDUSTRY KNOWLEDGE/AWARENESS
- COST (SLA, EQUIPMENT, MAINTENANCE)
- SECURITY (PERCEIVED RISK)
- SCALABILITY



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## Proof of stake



The probability of validating a new block is determined by how large of a stake a person hold.



The validators do not receive a block reward, instead they collect network fees as their reward.



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Proof of stake systems can be much more cost and energy efficient than proof of work, but are less proven.

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# A LIGHTWEIGHT TRUST MODEL IS NEEDED

- POW COMPUTE POWER IS TOO GREAT
- DATA INTEGRITY
- DEALING WITH BAD ACTORS

## Malicious Transactions – Traditional Consensus vs. Lightweight Trust Model

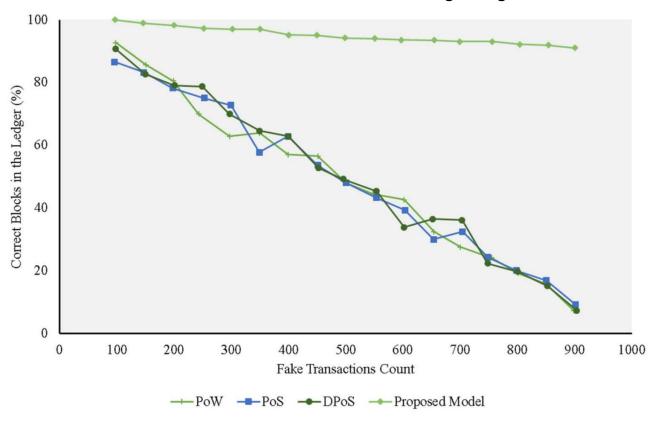


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