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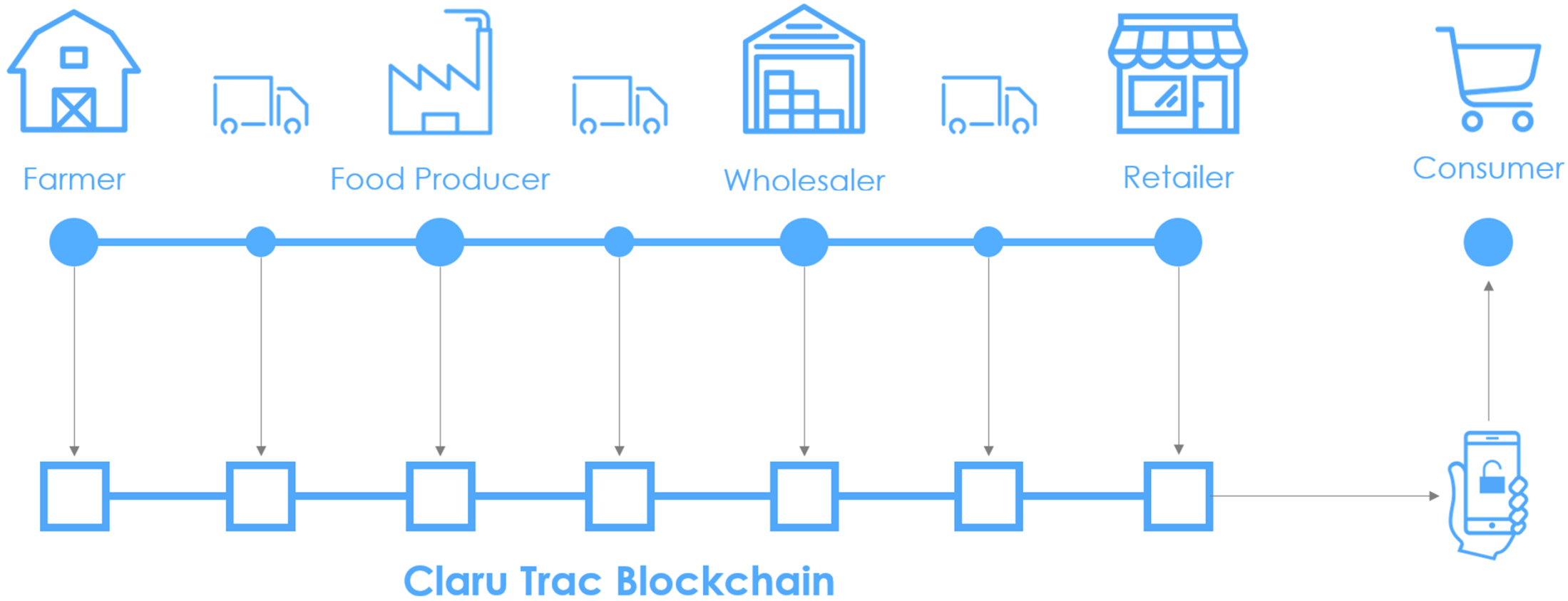# Food Traceability using Blockchain

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May 30th 2018

Claru Food Traceability

Farmer   Food Producer   Wholesaler   Retailer   Consumer

Claru Trac Blockchain

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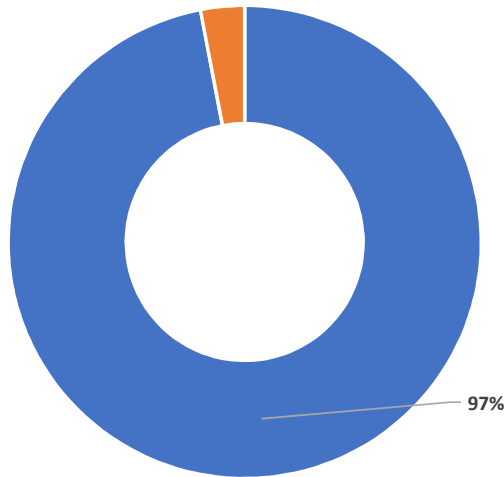# Good Food Doesn't stand a Chance!

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Consumers are overwhelmed by Marketing Noise
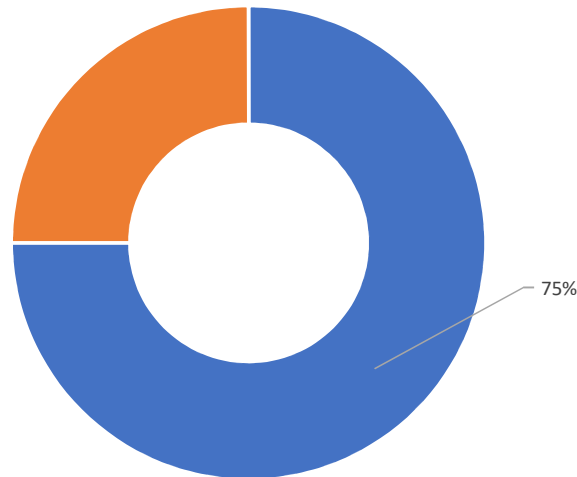

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Consumers Demand more Transparency

Transparency is very important to consumers across products
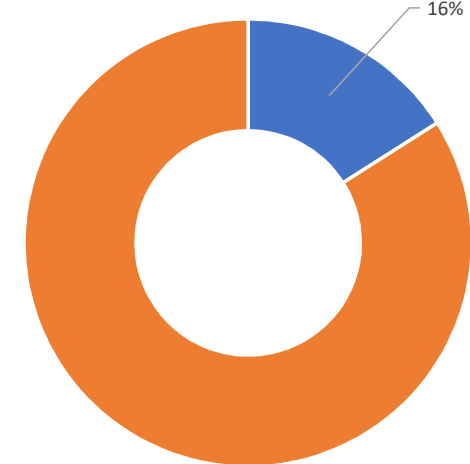
97%

source: LabelInsight

Consumers do not trust the accuracy of food labels

75%

source: LabelInsight

Only 16% of Consumers find Food Producers Trustworthy

16%

source: FoodThink - Building Trust in what we Eat (2013)

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Producers need more Transparency

Analytics

Traceability

Compliance

Food Supply Chain

Integration

Certification

Food Safety

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Blockchain for Supply Chain Traceability

Trust

Transparency

Real-Time

Tamper-Resistance

Need for a
shared common database? ◇ 1

Yes

Multiple parties involved? ◇ 2

Yes

Parties involved have conflicting
incentives and/or are not trusted? ◇ 3

Yes

No → **Blockchain is
not required**

Need for an
objective, immutable log? ◇ 4

Yes

Rules of transactions
do not change frequently? ◇ 5

Yes

Are transactions public? ◇ 6

Yes

**Public
Blockchain**

No → **Permissioned
Blockchain**
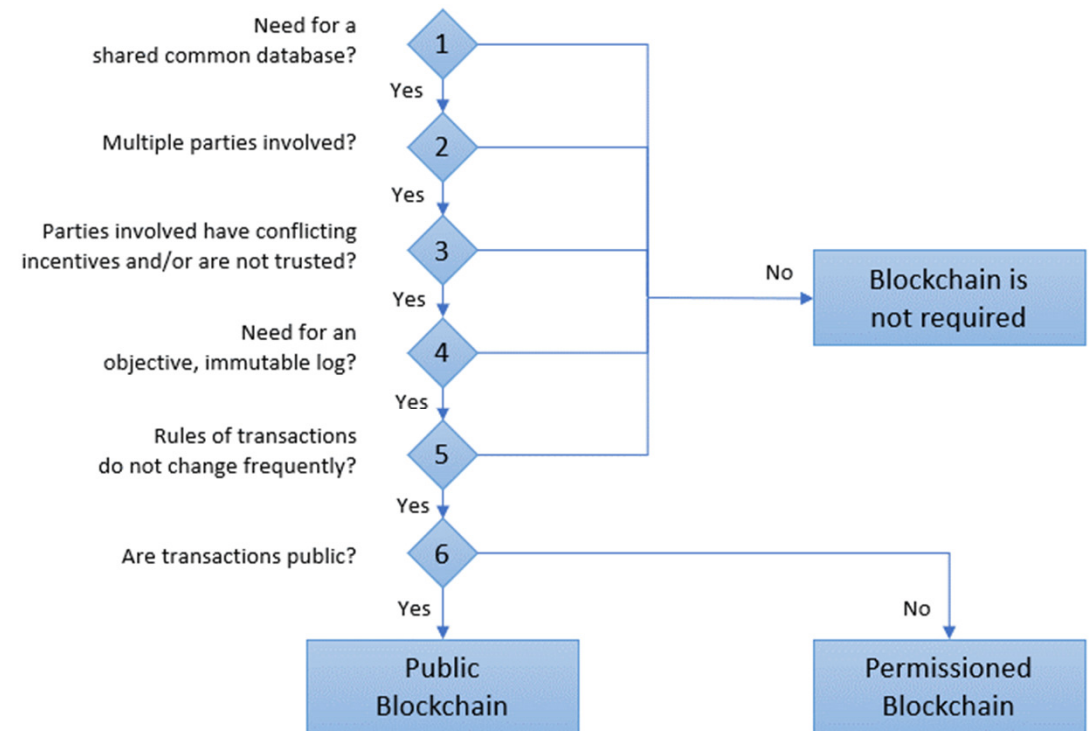
Based on graphic by "edX: Blockchain for Business — An Introduction to Hyperledger Technologies"

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A **Consortium Blockchain** can address some Challenges Companies may find with Public Blockchains

- Group of known, semi-trusted parties

- Access granted by members

- Consensus ~ majority vote (BFT)

- Consensus can withstand 1/3 of malicious nodes

- Data Storage

- Easier Governance

Public	Consortium
Data is Public	Privacy, Confidentiality
Transactions are Public	Private Channels
Pseudonymous	Known participants
Anyone can join	Permissioned
Anyone can access	Permissioned
Trustless Nodes	Semi-Trusted Nodes
Low tx/s	High tx/s
Unlikely GDPR Compliance	GDPR Compliance

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Consortium Blockchain Options

- Hyperledger
  - Linux Foundation, Open Source
  - Fabric (IBM)
    - Kafka orderer, key-value store
    - Go, Java
    - Federated Channels, Private transactions
  - Sawtooth (Intel)
    - larger networks, PoET
    - transaction families
  - Composer
- Quorum (JP Morgan Chase)
  - RAFT, Istanbul BFT
  - Ethereum fork
  - Privacy, Confidentiality

HYPERLEDGER FABRIC

HYPERLEDGER SAWTOOTH

Quorum

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Challenges for Blockchain Adoption

Distributed Systems

Authentication of Participants

Multi-party Rollout

GDPR

Physical-Digital Gap

Fragmentation

Consortium Blockchain Details

- BFT - Minimum of 4 nodes required
- PBFT (Fabric 0.6)
    - limited to 20-30 nodes (per channel)
- PoET (Sawtooth)
    - scales to hundreds of nodes
- Systems Integration requires significant effort
- Governance needs to be in place to manage PII exclusion
- Onboarding Government and NGO participants/nodes
- Authentication via mail to registered company address

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Adoption - Many Pilot Projects Underway

|	
Walmart	pilot for traceability of mangoes
Nestlé, Walmart, Costco, etc.	Consortium to identify blockchain use cases.
TE-Food	Migrating its at-scale solution for animal products
Chinese e-retailer JD.com	Enhance food traceability & safety in China
CBH	Executing Grain contracts
Honeysuckle White	Trace turkey back to the farm
Carrefour	Traceability of honey, eggs, cheese, milk, oranges, tomatoes, salmon and hamburgers

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Pilot with Rebel Chilli
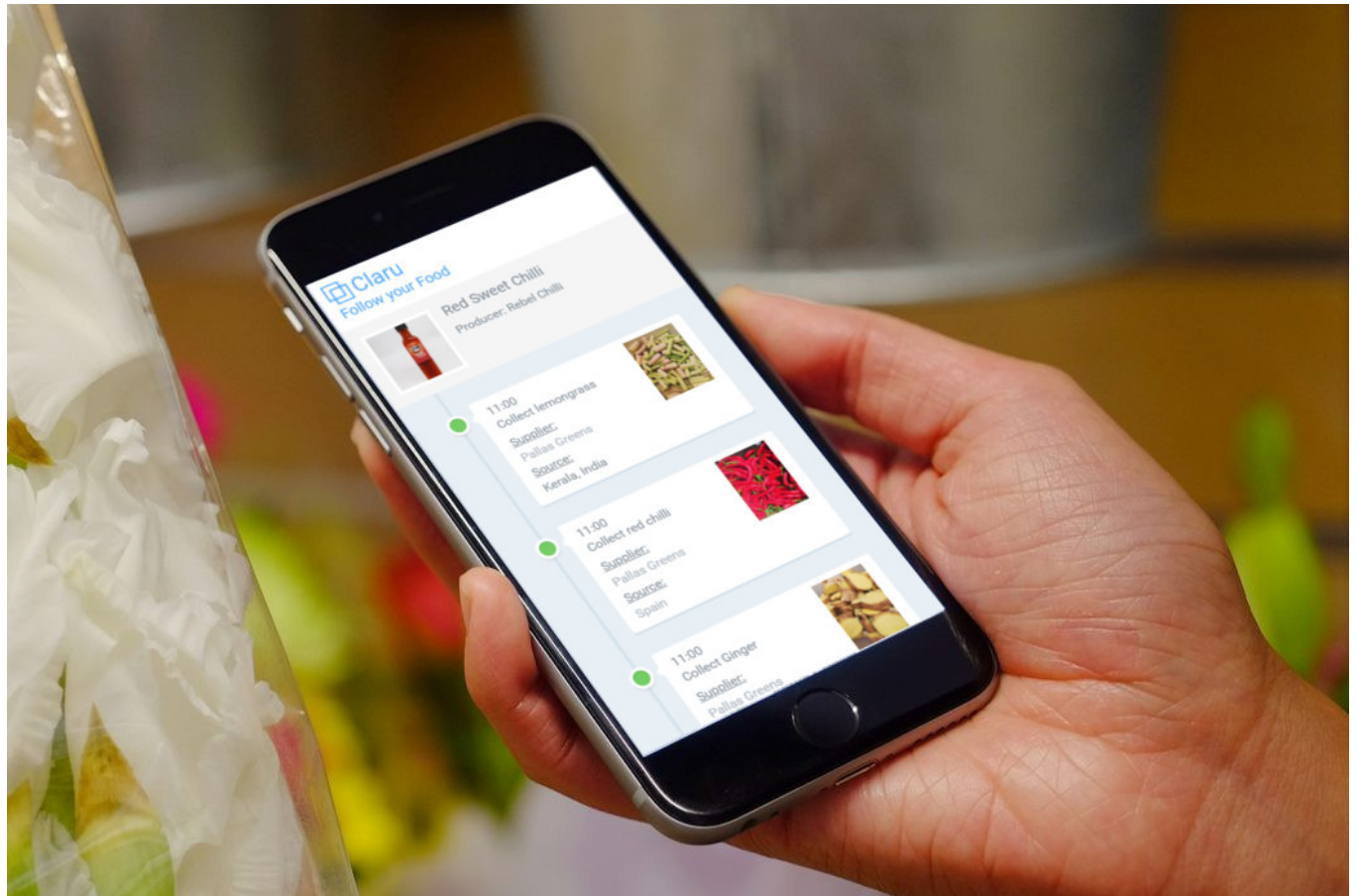
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Thank you,
any questions?

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