Transforming the Global Food System with IBM **Food Trust**™

July 2018

IBM **Blockchain**

IBM

Blockchain provides trust and transparency to solve key problems that have stymied supply chains for millennia

Data Visibility

- Eliminate information silos with only one shared ledger for transactions
- Increase confidence in the veracity of information being shared, and ensuring provenance, due to immutable records

Process Optimization

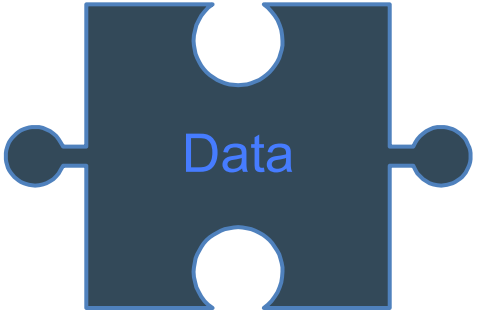
- Access rich end-to-end supply chain data instantly and easily
- Optimize operations due to the transparency of information

Demand Management

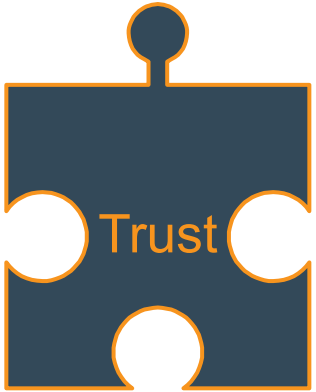
- Allocate inventory better due to insights from real-time demand forecasts
- Minimize waste with better allocation of goods and products based on data from the ecosystem

Blockchain creates the trust necessary to address the end-to-end process

We can connect the ever-increasing sets of data…



- 80% of worldwide data sit in silos
- 90% of data in the world today has been created in the last two years
- Less than 0.5% of all data is ever analyzed



BLOCKCHAIN

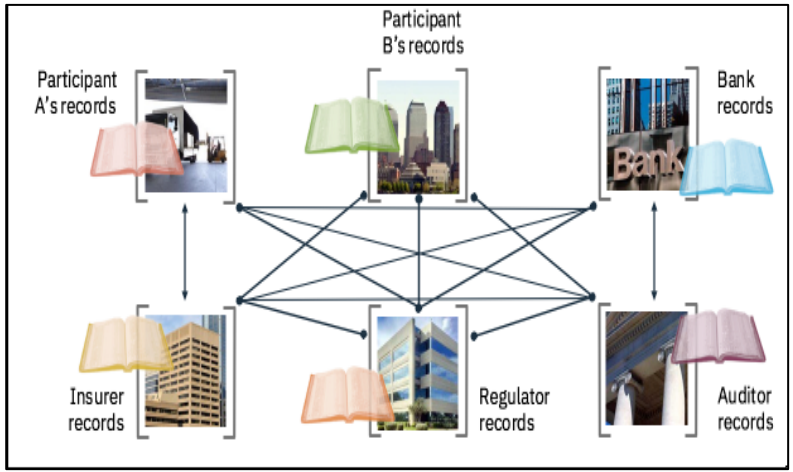
…with the ever-more-powerful analytics

- $130B+ is spent on big data and business analytics globally
- 73% of global CEOs report cognitive computing will play important role in the future of their organizations

Inefficiencies in business-to-business processes created by lack of trust and transparency can now be eliminated

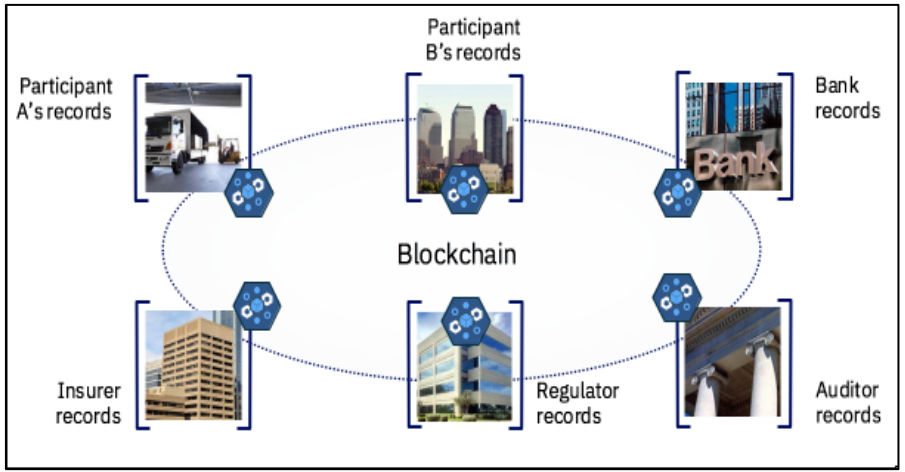
The Problem…

Inefficient, expensive, vulnerable



The Solution…

A shared, replicated, permissioned ledger…



…with consensus, provenance, immutability and finality.

Blockchain benefits enable new business models

Saves time

Transaction time from days to near instantaneous

Removes cost

Overheads and cost intermediaries

Reduces risk

Tampering, fraud & cyber crime

Increases trust

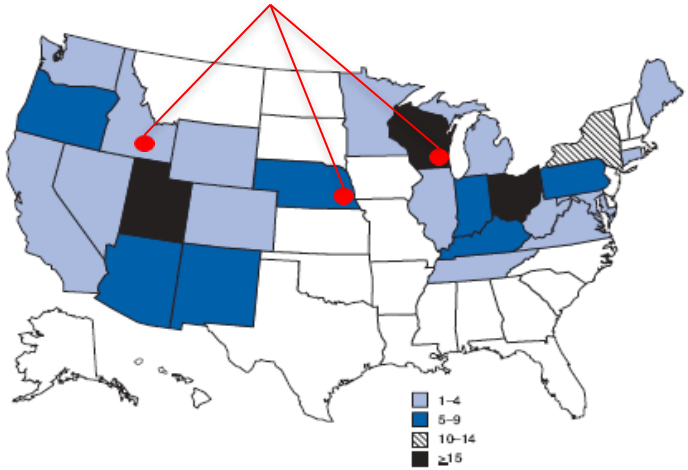
Through shared processes and recordkeeping

2006 E. Coli Outbreak in Spinach

Nationwide Impact

199 cases reported across **26** states, **31** hemolytic uremic syndrome (HUS) incidents

3 deaths



Country-wide Recall

Impact on the Industry

6-7 years

to recover…

…due to

1 supplier,
1 lot,
1 day

12 years later, not much has changed in identifying the source of contamination

April 21, 2018 — **First case of E. coli**

April 24, 2018

April 26, 2018

May 1, 2018

May 3, 2018

People are throwing out romaine lettuce, but why hasn't there been a recall?

USA TODAY NETWORK Sean Rossman, USA TODAY Published 4:32 p.m. ET April 24, 2018

(Photo: Justin Sullivan, Getty Images)

CONNECT TWEET LINKEDIN COMMENT EMAIL MORE

Government E. coli warnings have Americans throwing out romaine lettuce from Yuma, Arizona, but federal officials haven't announced a nationwide recall of the leafy greens.

The reason may be because there's no specific source of the possibly tainted lettuce.

U.S. Food and Drug Administration guidelines indicate recalls are placed voluntarily by a manufacturer or distributor who finds a product to be unsafe or defective. In the most recent E. coli outbreak affecting at least 53 people in 16 states, investigators haven't identified a brand, supplier, distributor or grower at fault.

"In the absence of a specific company or source, (the U.S. Food and Drug Administration) issues a public warning to let people know about a public health hazard to prevent unnecessary harm to consumers," said FDA spokesman Peter Cassell.

31 more sick in romaine lettuce E. coli

USA TODAY NETWORK Sean Rossman, USA TODAY Published 4:08 p.m. ET April 25, 2018

(Photo: Justin Sullivan, Getty Images)

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The U.S. Centers for Disease Control and Prevention said 31 more people have fallen ill in an E. coli outbreak tied to romaine lettuce.

The total number of cases now stands at 84 and the outbreak has spread to 19 states, the CDC said Wednesday afternoon. Forty-two patients were hospitalized and nine developed a form of kidney failure. No deaths have been reported.

Investigators have not yet identified a grower, supplier, distributor or brand responsible for the outbreak, the CDC said, although it has been traced to the Yuma, Arizona, region.

The CDC warns people not to eat any form of romaine lettuce from Yuma area. Romaine confirmed not to be from the Yuma area is OK to eat.

The E. coli spreading through the states is "toxin-producing," the CDC states — specifically a toxin known as Shiga. People get sick within two to eight days of swallowing the germ, which causes diarrhea, stomach cramps and vomiting. Although most recover in one week, it could lead to kidney failure.

98 Reports Of E. Coli From 22 States Now Linked To Romaine Lettuce

May 1, 2018 at 10:01 am Filed Under: CDC, E. Coli, Romaine Lettuce

LOS ANGELES — The current E. coli outbreak tied to romaine lettuce is the worst multi-state outbreak in more than a decade, according to health officials. The Centers for Disease Control and Prevention announced Friday that the food poisoning outbreak has spread to three more states.

Health officials said they now have reports of 98 cases in 22 states, with the addition of Mississippi, Tennessee and Wisconsin. The outbreak is blamed on E. coli bacteria in romaine lettuce grown in Yuma, Arizona.

According to CDC data, the U.S. hasn't seen a multi-state outbreak this large since 2006. That outbreak was traced back to spinach and was linked to 238 illnesses and five deaths.

Like the 2006 outbreak, the CDC says the bacteria strain behind the current outbreak tends to cause more serious illnesses. Forty-six people have been hospitalized, including 10 with a form of kidney failure called hemolytic uremic syndrome (HUS). The most recent illness began a week ago. No deaths have been reported.

In a press briefing on Friday, Matthew Wise, Ph.D., M.P.H., deputy branch chief for Outbreak Response at CDC, said officials expect more illnesses to be reported.

To Your Health

First death reported from E. coli-contaminated romaine lettuce as outbreak spreads

By Joel Achenbach May 3 at 3:22 PM Email the author

Romaine lettuce (iStock)

The nationwide food poisoning outbreak from E. coli-contaminated romaine lettuce has claimed its first fatality, an unidentified person in California, and the infections have sickened a total of 121 people in 25 states, the U.S. Centers for Disease Control and Prevention announced Wednesday.

IBM **Blockchain**

IBM Food Trust provides value to the entire food ecosystem

Growers

- Prove farm is not a source of outbreak
- Ease of connectivity to the supply chain

Food Manufacturers/CPGs

- Instill trust between retails, suppliers & customers
- Automate & reduce manual certificate management

Wholesalers/ Distributors

- Conduct targeted recalls
- Enable internal data sharing

Food Logistics

- Enhance ability to meet compliance standards
- Reduce manual processes

Food Retailers

- Assure customers food supplied is safe
- Conduct targeted recalls quickly

Consumers

- Learn about recalls and increased transparency
- Reduce risk of being victimized by food fraud

Certification Bodies

- Reduce fraudulent certificates
- Increase renewal speed

Food Service

- Assure customers food supplied Is safe
- Reduce wasted food

Regulators

- Identify contamination quickly
- Reduce unnecessary testing

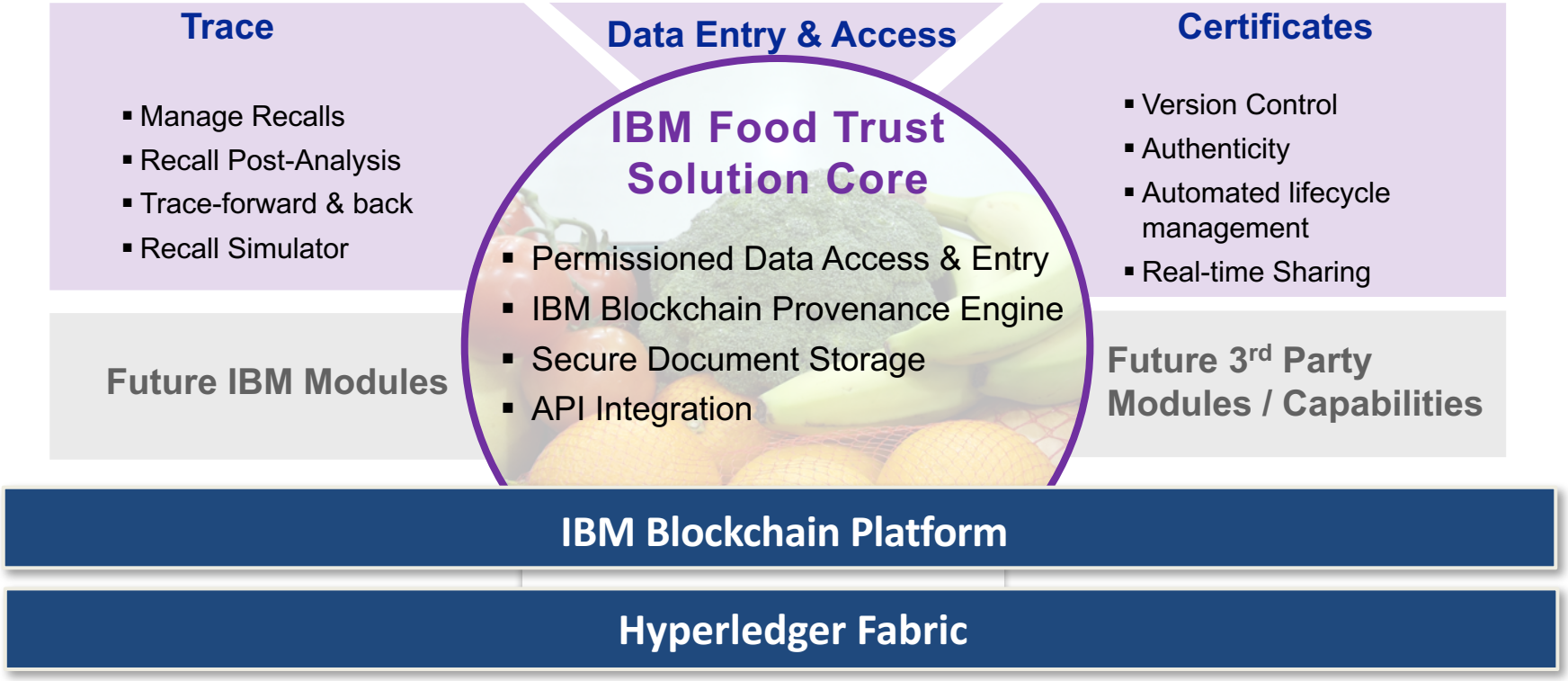
Introducing IBM Food Trust built on Blockchain technology

IBM Food Trust is a modularized solution available as a service providing traceability to improve food transparency and efficiency

Blockchain is used to create a trusted connection with shared value for all ecosystem participants, including end consumers

The solution offers connectors for interoperability and leveraging existing standards (e.g., GS1)

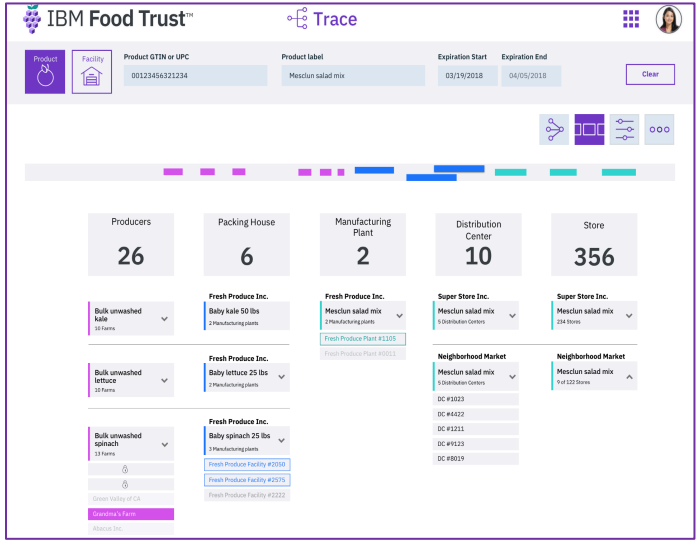
The IBM Food Trust solution is a set of modules built for the industry



Key modules are Trace and Certificates

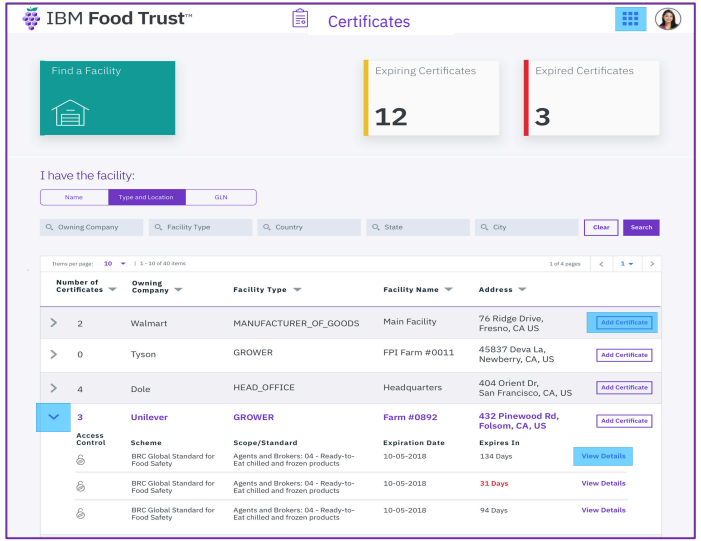
Trace

Instant access to end-to-end traceability data to verify history and real-time location and status in the supply chain



Certificates

Ability to upload, manage, access, edit and share compliance documentation, test results and audit certificates



IBM Blockchain Platform

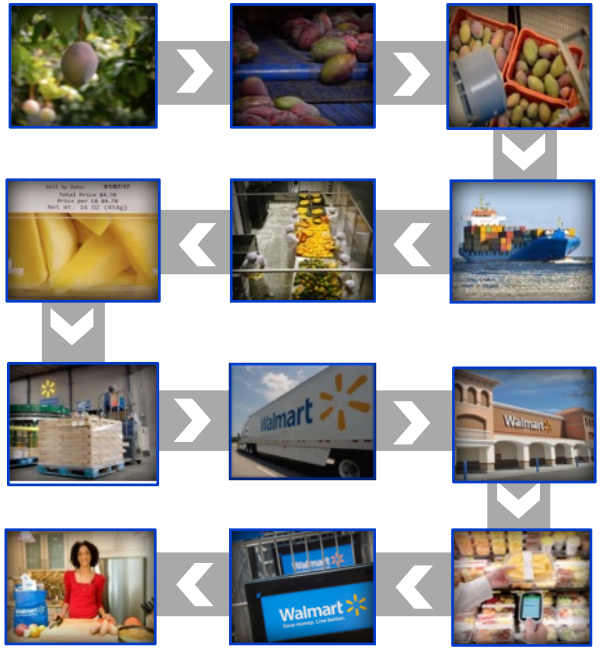
Hyperledger Fabric

The effectiveness of the IBM Food Trust solution was demonstrated with a Walmart mango pilot

Pilot Test Case

How long does it take to trace a package of sliced mangoes back to the farm?

Supply Chain



Results

Typical manual, mixed digital and paper-based method

6 days
18 hours
26 minutes

IBM Food Trust digital solution

2.2 seconds

Where are we on our journey?

2016 — 2017 — 2018

Walmart conducts traceability pilots

Additional partners joined the IBM Food Trust™ network, with growing food data transactions

Onboarding agriculture, ingredient suppliers, retailers, CPGs, QSRs and others

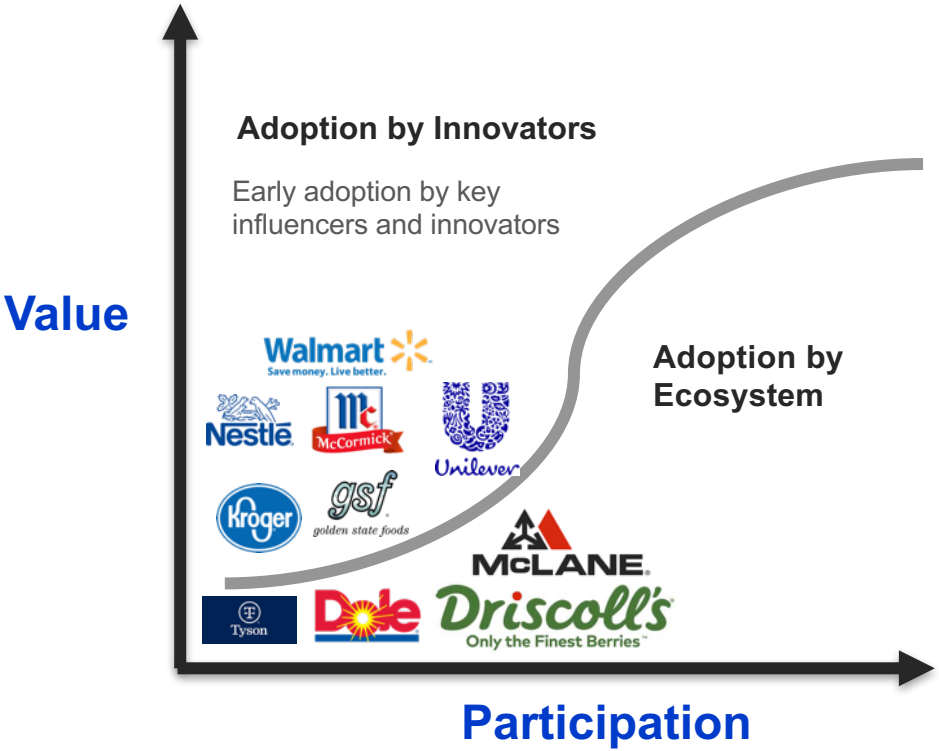
Pork
Traceability / safety

Mango
Traceability / global trade

Dole, Driscoll's (Only the Finest Berries™), gsf golden state foods, Kroger, McCormick, McLANE, Nestlé, Tyson, Unilever, Walmart

…and others

We are scaling the IBM Food Trust digital ecosystem, starting with early adopters to innovate and test the solution



Shared Value: Value proposition/pricing resonate for all ecosystem participants

User Experience: Easy to onboard and obtain value for participants at any technological maturity level

Industry Standards: Leveraging existing standards to facilitate rapid adoption

Enterprise Ready: Built for business usage with security, scalability, reliability, etc.

Extended Value: Analytic tools dramatically raise the value of the more complete data set

What lessons have we learned during this journey?

Blockchain is fundamentally different from other technology enablers because it requires a network or ecosystem to provide value

To drive true transformation it is critical to address:

Business model	Governance model	Trust model
Ensure that there is shared business value across all participants in the ecosystem	Ensure the right rules for: i. membership in the network ii. data ownership, access and usage rights iii. lifecycle management of business logic and smart contracts on the network iv. clients/3rd parties to deliver value added services to the ecosystem	Ensure that the solution provides the right trust guarantees to all participants

How you can get started with IBM Food Trust

1. **Signup** with IBM Food Trust

2. **Onboard** to SaaS solution and become a network participant

3. **Add** modules to gain access to their capabilities

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Thank You

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