About **IBM Food Trust**

www.ibm.com/**food**

Table of **contents**

What is Food Trust? 3

Food Trust with blockchain 5

Module-based approach 6

- Trace 7
- Fresh insights 8
- Certifications 9
- Data entry and access 10

Food Trust core-blockchain capabilities 11

Food Trust Governance Model 12

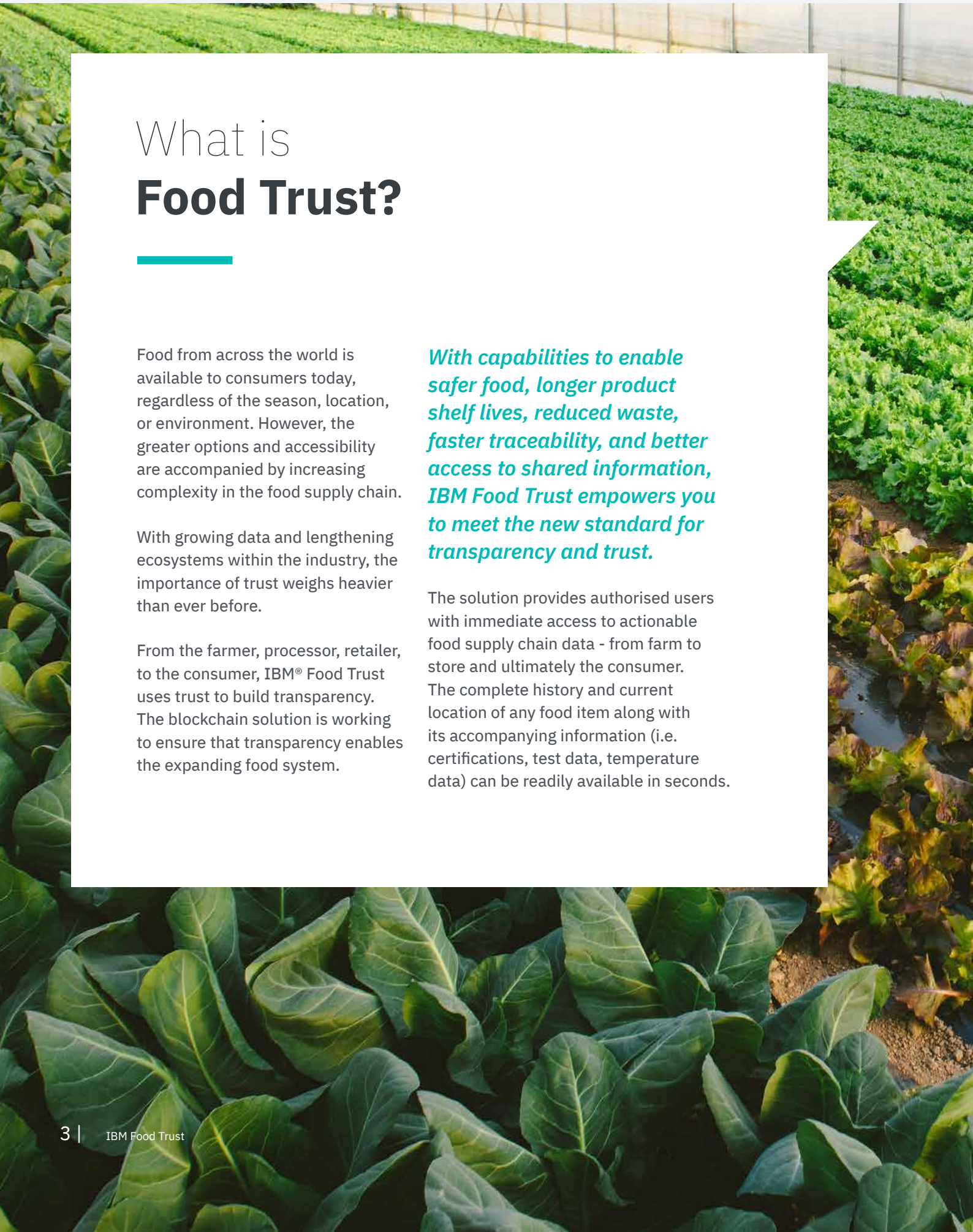
Network and data security 13

Onboarding and support 14

Building your team 15

Why Food Trust? 16

Join now 17



What is **Food Trust?**

Food from across the world is available to consumers today, regardless of the season, location, or environment. However, the greater options and accessibility are accompanied by increasing complexity in the food supply chain.

With growing data and lengthening ecosystems within the industry, the importance of trust weighs heavier than ever before.

From the farmer, processor, retailer, to the consumer, IBM® Food Trust uses trust to build transparency. The blockchain solution is working to ensure that transparency enables the expanding food system.

With capabilities to enable safer food, longer product shelf lives, reduced waste, faster traceability, and better access to shared information, IBM Food Trust empowers you to meet the new standard for transparency and trust.

The solution provides authorised users with immediate access to actionable food supply chain data - from farm to store and ultimately the consumer. The complete history and current location of any food item along with its accompanying information (i.e. certifications, test data, temperature data) can be readily available in seconds.

Food Trust provides your organisation with a set of integrated modules to address the increased complexity and build trust in the industry.

Supply chain efficiencies

Operate using smarter processes across a shared food system by identifying process inefficiencies, leveraging data insights for demand forecasting, scaling with automation and optimising your business for continuous growth.

Brand story

Through increased visibility, empower consumers, retailers, manufacturers, suppliers and producers with confidence and trust in companies that we purchase and consume our food from.

Food freshness

Gain unprecedented visibility into supply chain data for valuable insights and analysis, identifying inefficiencies and ensuring quality of goods sold.

Food safety

Securely trace products in seconds to mitigate waste, cross-contamination and spread of foodborne illness.

Food fraud

Enable full transparency by digitizing transaction records and storing them in a decentralised and immutable manner, eliminating the opportunity for fraud across the food system.

Reduce waste

Share and manage data across the food supply chain, helping to increase efficiency, reduce product loss, and optimise your ecosystem.

Sustainability

Digitise essential certificates and documents to optimise information management, certify provenance and ensure authenticity.

Food Trust
with blockchain

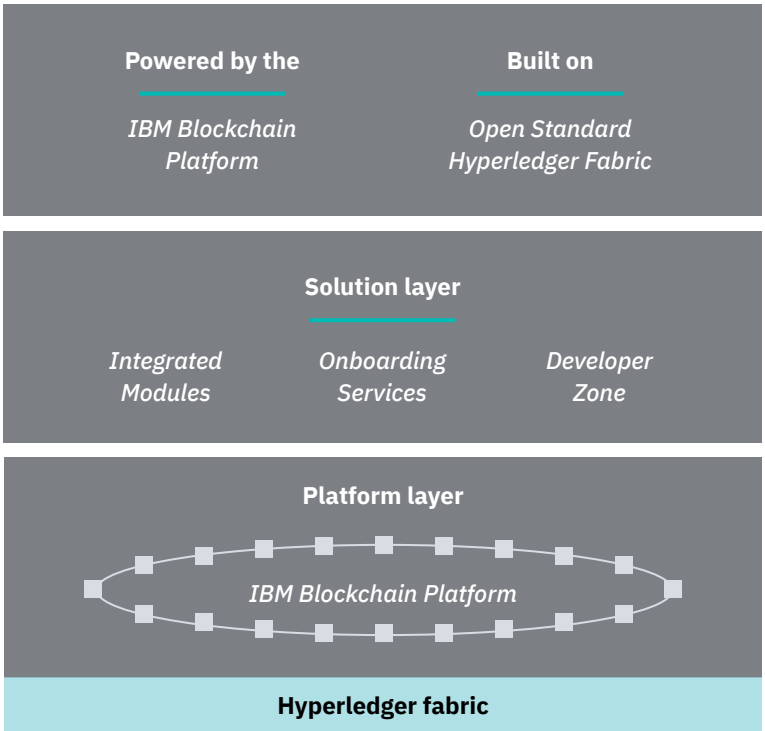
IBM Food Trust combines supply chain modules with blockchain core functions, delivering business value to the food ecosystem from the combination of governance, standards and interoperability and technology.

The solution provides participants with a permission-based, shared view of food ecosystem information, allowing convenient data publishing and controlled sharing of information. To achieve this goal, the Food Trust solution enables participants to enter and control access to their encrypted blockchain data.

In doing so, transaction partners can only access the data they are permissioned to view. Permissioned data access is an integral part of the core solution. Access controls ensure that the organisation that owns the data maintains full control over who can access it on the network.

Food Trust solution users can quickly locate items from the supply chain, in real time, by querying food product identifiers such as Global Trade Item Number (GTIN) or Universal Product Code (UPC), using the product name and filtering on dates.

All data is stored on blockchain ledgers, protected with the highest level of commercially-available, tamper-resistant encryption.



Module-based **approach**

IBM Food Trust's integrated set of modules address various pain points and needs in the food industry.

Trace

Provide the provenance of your product through immediate access to end-to-end (E2E) data. Trace also shows real-time location and status and allow expedited product recalls.

Fresh Insights

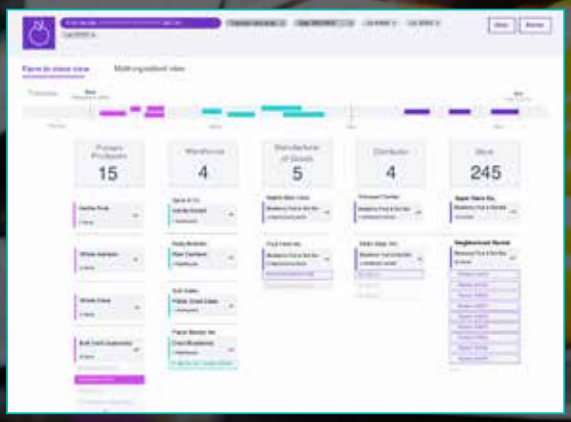
Connect disparate product data to draw insights and gain visibility into inventory across the supply chain, compare metrics across location, view dwell time and time since production/to expiration and calculate at-risk inventory. You can identify inefficiencies, improve freshness and reduce product losses.

Certifications

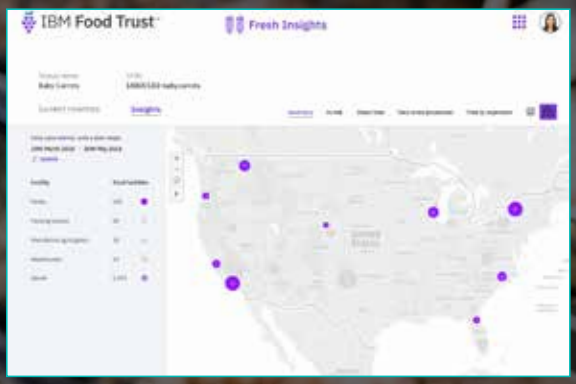
Digitise business critical certificates and inspection documents to optimise efficiency for information management, certify provenance and ensure authenticity.

Data entry and access

Leveraging solution and global standards to share data with any network participant authorised by the data owner, you can feel confident knowing your data is shared only with need-to-know business partners in a secure and confidential environment.



Trace



Fresh insights

Certifications

Module-based approach

Trace

How do I guarantee the provenance of my food products?
Can I manage the upstream and downstream journey of my items?
What is the source of the contamination?

This module enables participant organisations to quickly and accurately determine the path that a given shipment has taken.

In a transparent and secure network, you can gain visibility upstream or downstream, view location or status and verify credibility or safety. The Trace module enables effective management and food safety across your entire food system.

Speed and accuracy are also key to compliance with global regulations aimed at food safety and fraud, such as the US 2011 Food Safety Modernisation Act.

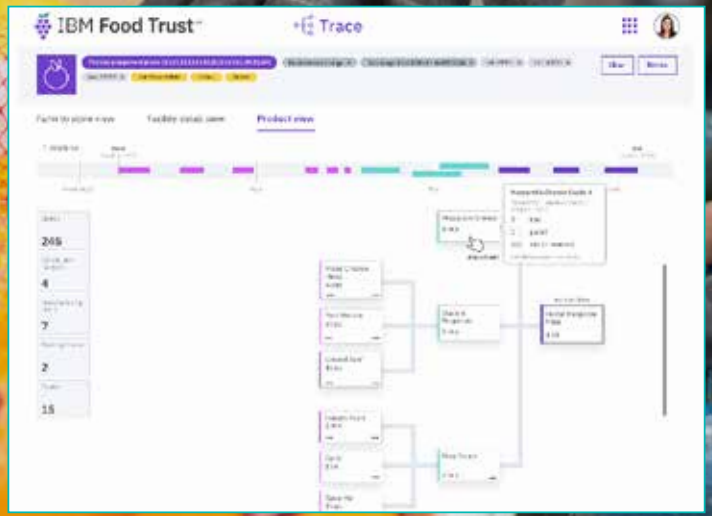
To use the Food Trust solution to trace food products, data on food products needs to be uploaded to the network by participants.

Once data is uploaded, the trace module allows an authorized user to search the provenance of a food product (via GTIN, product name, or Purchase Order) and can narrow down by a specific date.

Authorized participants can then determine the scope of the problem, block further contamination, and narrow the scope and impact of a recall.

Trace benefits

- Verify provenance and credibility in seconds
- Ability to quickly identify when food is contaminated and react immediately
- Ability to prove your product is safe during a foodborne outbreak
- Reduce product waste
- Increased customer satisfaction and trust.



Module-based approach

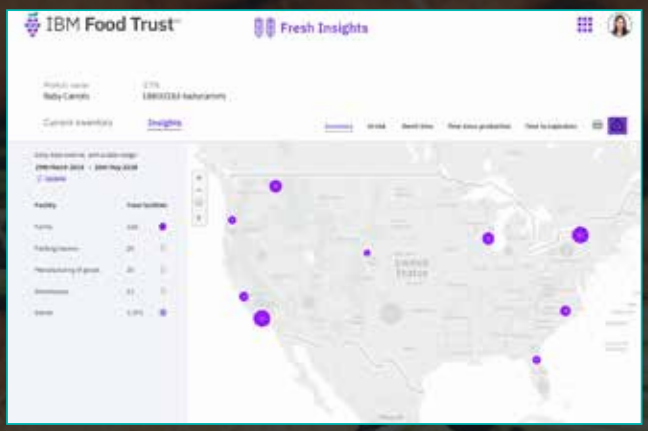
Fresh insights

How can I optimise my inventory management and improve my supply chain processes? Do we leverage the most efficient processes for the business? Are the products being handled with optimal conditions for extended shelf life?

This module enables organisations to insightfully use existing data collected from current processes, such as dwell time, time since harvested and inventory.

While the Trace module connects data to enable provenance, the Fresh Insights module adds a layer that provides analyses on the connected data. From multiple shipments, lots, facilities, product creations, packing, purchase orders, transformation, dispatch and more, the food system data is collected and aggregated on blockchain. Within the module, the data is channeled to provide users with information on:

- Current inventory & Current at-risk inventory
- Dwell time: how long does a facility keep a product (GTIN) over time
- Time since harvest / production: aging of a product as it enters a facility
- Inflow / Outflow: volume at each facility of a product over time.



User Interface

Categorised into a “Current inventory” and an “Insights” view, the user interface provides details into your supply chain and inventory. Including a summary of product movements across locations, users can also view the time passed since production and packing, time until expiration, freshness issues, sub-par dwell times, and at-risk inventory.

APIs

Use of APIs with Fresh Insights leverages data from internal systems to conduct a holistic analysis of your entire food system.

Extensions

Additional capabilities are available by adding data sources to extract custom details. For instance, cold chain data and analyses can be pulled from temperature and humidity sensors, IoT devices, RFID, and more. Moreover, enable alerts and build custom dashboards to manage and utilise your insights.

Module-based approach

Certifications

Was this batch of grain shipped through a warehouse with shoddy safety practices? Has this grower been inspected recently?

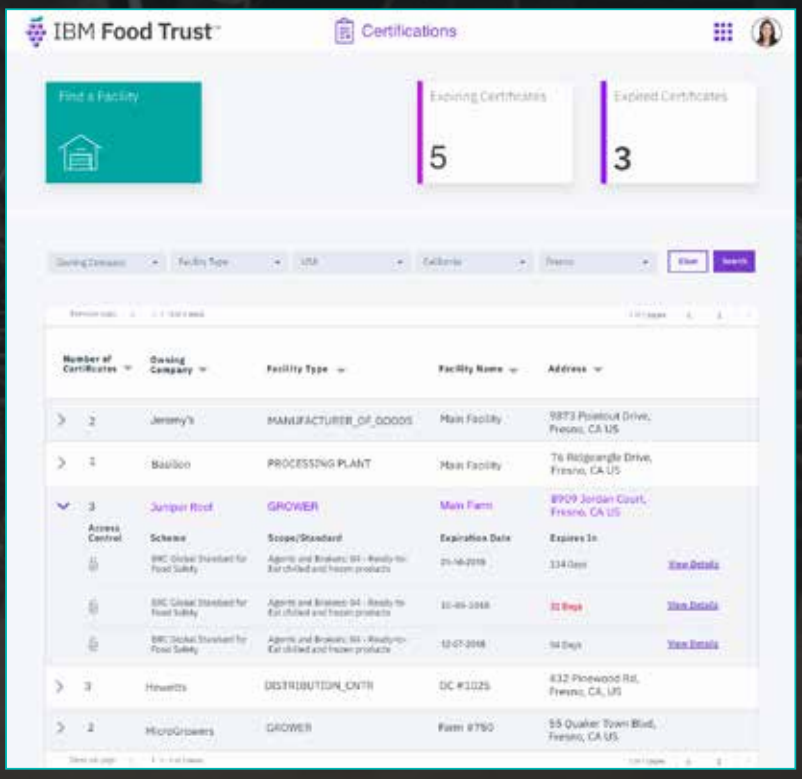
With the Certifications module, documents can be checked regularly, or as they are needed in the event of a safety investigation.

Certificates and related documents can help establish that a facility is properly inspected, that livestock have been treated according to law, that a supplier is legally able to do business, and that a farm is certified as conforming to industry standards.

Certifications, however, can be issued by agencies or organisations with differing and overlapping authority, with different jurisdictions and with widely varying time windows of validity. Verifying that certificates are complete, valid and current is complicated by their abundance, complexity, and variety.

To simplify this task, Food Trust offers a holistic approach with the Certifications module to help track and store all certificates.

The designated Certificate Manager is authorized to upload and manage the organization's facility certificates as well as other business-enabling documents, such as authorisations, licenses and inspection results. Conflicting or outdated certificates can be easily flagged for review, which serves both suppliers who require certification to do business and buyers who want to know the certification status of a sourcing farm or factory.



Module-based approach

Data entry and access

Each member organisation owns its data on the blockchain network and maintains full control over who can access different data elements. All data is made accessible only as data owners grant permission to share relevant records.

Solution software adapters can provide automated data import from existing data stores, such as SAP, to leverage existing business records including inventory lists, order records and supplier information.

For network administrators already managing complex information environments, the IBM Food Trust Connector API is designed to automate the integration of legacy system data and network data.

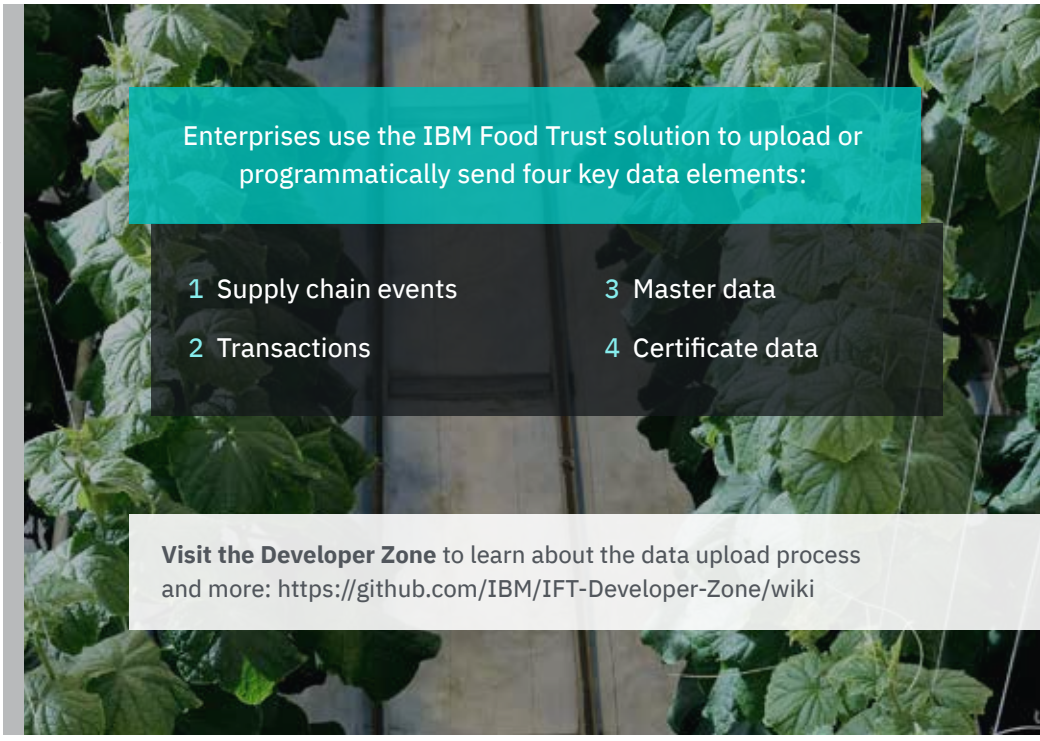
Data connector application programming interfaces (APIs) allow enterprise IT teams to efficiently upload supply chain data from existing data stores (such as SAP) to their IBM Food Trust network for seamless integration of data from enterprise systems to an IBM Food Trust solution network. Smaller organisations can onboard data through an easy-to-use web experience.

SOE users automatically upload transaction data to the solution network, based on the organisation's data specifications.

Once an enterprise has joined and onboarded, its users and SOE accounts can interact with the network in several ways:

- Employ user-friendly interfaces for desktop or mobile use
- Use the Certifications module to upload regulation and inspection documents for sharing with food supply chain partners
- Use the customised interface to view and manage data that has been shared by business partners.

Note: GS1 registration is not required to use IBM Food Trust. However, for companies who have registered with GS1, IBM Food Trust supports continued use of existing enterprise IDs.



Enterprises use the IBM Food Trust solution to upload or programmatically send four key data elements:

1 Supply chain events
2 Transactions
3 Master data
4 Certificate data

Visit the Developer Zone to learn about the data upload process and more: https://github.com/IBM/IFT-Developer-Zone/wiki

Food Trust
core-blockchain capabilities

Our blockchain solution establishes a trusted and permissioned environment for food transactions, where all participants can collaborate in a secure and purposeful way.

Essential components of an open blockchain cloud-based solution include:

APIs

- IBM Food Trust is developing a rich set of APIs to deepen the ecosystem and grow its value for our members and partners
- APIs serve as the programmatic version of the UI-based IBM Food Trust modules, so trusted data can be used in a self-developed environment
- APIs can also be used for 3rd party integration, such as Inventory tracking, Consumer apps, Supply chain management apps, Temperature monitoring, Industry group applications.

Trust anchors

- Trust Anchors are participants of the Food Trust network, such as retailers and food suppliers, that are collectively responsible for maintaining integrity of the shared ledger and assisting on meeting security, as well as privacy and permission guarantees.

Smart contracts

- Any IBM Food Trust participant can install a peer and instantiate a Smart Contract in a Private Channel- between two or more specific network members, in order to automate Supply Chain Decision making
- Smart Contracts use pre-defined business rules / pre-agreed terms with transaction partners and reduce extraneous dispute resolutions needed based on trusted and immutable data
- Every party involved in running the smart contract has to have their own peer. Smart contracts run in a private channel where only the parties interested in maintaining the contract have access, as data in that channel is unencrypted.

Remote deployment

- As part of Trust Anchor channel or private channel, members can deploy their peer remotely in preferred cloud or on-premises environment, using IBM Blockchain Platform for IBM Cloud Private.

Food Trust
Governance Model

The Governance Model includes fundamental policies that enable a collaborative ecosystem and ensures all participants are held to the highest standards – while receiving value.

The Advisory Council, comprised of a range of industry representatives, helps set the rules of engagement and leads accountability in adhering to the governance agreement for the blockchain community, ensuring that the solution benefits all. The council formally reviews and ensures the policies meet the needs and values of the global Food Trust community across various segments, sizes, and geographies, and more.

As a participating member, IBM does not own any data uploaded by users onto the network and cannot use or share data for commercial or other purposes.

A secure ecosystem and a trusted community

Every participant is vetted to confirm their identity and ensure that all operate on the ecosystem's principles. This means that your experience with fellow community members is as trustworthy as your experience with the network itself.

Interoperability... and beyond

Because it is built on the open-standard, open-governance Linux Hyperledger Fabric, IBM Food Trust can connect to the systems and programs you have today, and can scale with you to connect to new blockchain and non-blockchain networks in the future.

Data that you upload, own, and control

You're in full control of the data you share on IBM Food Trust. And, as the owner of the data, you determine what you share, when you share it, and who gets to see it.

Guard against collusion

The trust model of the solution describes the set of guarantees that reinforces the security, privacy, and integrity in a network of widely diverse participants. Our model promotes collective responsibility, while guarding against collusion – maintaining the integrity of the network.

Guiding the future of the food ecosystem

Everyone has their unique business needs. The Food Trust Advisory Council ensures that all of these needs are met—and that the solution continually evolves to provide participants with value well into the future. The end goal: to reduce friction points by creating a trusted and transparent food system.

The Food Trust Governance Model is continually re-evaluated and updated based on expansion of the solution, member needs, technology innovation, and regulatory changes.

Network and data security

"How is security handled?"

"How is data handled?"

As with any distributed network that relies on encryption and controlled access for vital record-keeping, there will be questions.

Those answers will make the difference between a system worth implementing and one that presents a danger to the enterprise.

IBM Food Trust provides the highest level of commercially-available, tamper-resistant protection for food transaction data, employing the security benefits of the underlying IBM Blockchain Platform and Hyperledger Fabric.

Hyperledger Fabric requires no proof-of-work or other processor-intensive computations to guarantee the legitimacy and permanence of network transactions, and features a thoroughly permissioned network. The owner of the data controls who can see it on a Hyperledger Fabric network.

From a network and data security point of view, your IT personnel can take the following steps to understand and prepare your environment:

- Identify relevant supply-chain processes
- Identify users, including automated users of the solution
- Estimate and assign technical resources
- Access the security needs of each user, including external stakeholders, and initiate security clearances and other security processes.

Onboarding and support

Onboarding onto IBM Food Trust requires uploading data about your product lifecycle: from harvesting to manufacturing to transportation, by item, location and purchase order.

To get started on the solution, there is no need to know blockchain. We work with data you are already using and with standards that you already know. It starts with you and your data.

Which onboarding and support options are available?

- **Self Guided Onboarding**
  Onboard independently using self-service education and community forum
- **Virtually Guided Onboarding**
  Interact with experts in pre-defined education modules and for additional questions
- **Assisted Onboarding**
  Receive a dedicated expert to guide you through the full onboarding experience
- **Standard Support for IBM Food Trust**
  Access the digital support portal with enhanced transparency into ticket resolution, and receive assistance by preferred method: chat, email, forum, or phone

Which data can be added into IBM Food Trust?

- **Master data** describe organization facility locations and trade items, and are expected to be largely static
- **Business transactions** include purchase orders, advance shipping notices, and receipt confirmations
- **EPCIS events** correspond to the GS1 EPCIS standard that describe real world events happening across your supply chain
- **Certificate data** describe facility certificates, such as audit dates and scores, and expiration dates
- **Payload data** include additional food related data (e.g. temperature, humidity) that can be linked to EPCIS events data to enrich insights into the supply chain

What are the ways to integrate my data?

- Automation
- XML upload
- Excel upload
- Direct data entry

Building
your team

Joining the Food Trust ecosystem begins with signing up online and purchasing the most appropriate plans for your organization. Enrollment in a solution network includes the creation of accounts for both human users and systems of engagement (SOE) users.

Once you have access to the solution, you will onboard your organization by building and authorizing a team to register and integrate a pertinent information of data.

The IBM Food Trust solution assigns predefined roles that grant users authorization to execute specific network tasks on behalf of their organization.

Assigning roles enables account administrators to easily control the level of access provided to each individual user in their organisation. When onboarding new users to the solution, an account administrator must assign a role to each user.

Onboarding to the Food Trust Ecosystem:

- Prepare your supply chain expert(s) and data expert(s)
- Identifying your facilities and products
- Defining your product scenarios
- Uploading data and setting up permissions.

Team roles include:

Account owner
User can manage organisation account settings and subscriptions

Account administrator
User can add, delete, and modify users and can modify organization settings

Onboarding team member
User(s) can create product scenarios and upload data

Why Food Trust?

Blockchain solutions require more than the technology for adoption and impact within companies and throughout industries. IBM Food Trust is not only built on a secure and reliable platform, but also recognises the critical factors for collaboration and action of all in the food system.

The 5 Pillars of IBM Food Trust explores the fundamental facets equally important in achieving an effective blockchain solution:

Business value

Companies participating in the ecosystem are able to do so in a way that aligns to their business values. Every party has a role to play in the food system; consequently, each participant receives a unique benefit to their organization.

Ecosystem

Food companies are the main actors spearheading change in their industry. Committed and innovative brands are providing the insights to make an impact and driving the momentum to usher in a new era of trust and transparency.

Governance model

Those adopting the technology should be defining how it works for them, and be comfortable using the solution. The governance model guides the use of the solution by the players, including data ownership, access and permissions.

Standards & interoperability

Companies are investing in technology that allows users to leverage and learn from other technologies. Food Trust is committed to global standards and interoperability with other companies and vendors to promote adoption in the long term.

Technology

Organisations rely on our technology to provide consistent, reliable, and secure access to data and insights. Additionally, all the pillars are shaping how we move forward in building the technology.

The 5 Pillars are what created the only enterprise-class blockchain solution for the food system today.

Join now

Learn how to join

View pricing

Try the solution

See it in action