

TECH & AI CASE STUDY - FOOD PRODUCER - 2026

Blockchain Traceability That Cut Recall Tracing From Days to Minutes

Based on a delivery engagement with HarvestRow Foods

days to minutes

MOCK RECALL TRACING

+\$3.2M

NEW RETAIL REVENUE

11% to 9%

COLD-CHAIN WASTE

96%

GROWER APP ADOPTION

A fillable practice edition: the full story, 8 actions,
6 reflections and a 90-day plan - work it with your team.

Free - no email required
emersontechnology.com

MAKE THIS PRACTICE BOOK YOURS

Work it, do not just read it

This practice book turns the HarvestRow Foods case study into a working session for your team. Read the full story first - what happened, what was built and what it changed. Then tick the 8 actions you can commit to, write short answers to the 6 reflections, and finish with a 90-day plan. Every field in this PDF is fillable: open it in Adobe Acrobat Reader, Chrome, Edge or macOS Preview, type directly into the boxes and save.

YOUR NAME	ROLE
COMPANY	TEAM / DEPARTMENT
DATE	EMAIL (OPTIONAL)

MY GOAL FOR THIS PRACTICE SESSION

- 01 The story** - What happened at HarvestRow Foods - before, during and after the project.
- 02 The results** - The numbers that changed, plus industry benchmarks from public research.
- 03 The 8-action checklist** - Tick boxes as your organization completes each step. Owner and date fields included.
- 04 The 6 reflections** - Fillable questions that pressure-test your own roadmap.
- 05 My 90-day plan** - Three fillable phase cards that turn this case study into your roadmap.

RUN IT AS A 90-MINUTE TEAM SESSION

25 min READ Read the story together. Ask everyone to note the one number that surprised them most.	40 min PRACTICE Work the 8-action checklist and the 6 reflections. Assign an owner and a date to every action you commit to.	25 min COMMIT Fill in the 90-day plan. One goal per phase, one number that tells you it worked. Book a review date before you leave the room.
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THE STORY

What happened, and why it worked

01 The Company

HarvestRow Foods packages fresh salads and cut fruit for national grocery chains, operating packing facilities that turn perishable raw product into shelf-ready cases at a pace measured in hours, not days. The company sources from 240 grower partners across four countries, and that sourcing web is both its strength and its exposure: every lot of romaine, melon or leafy greens arrives with a different grower, a different harvest date and a different set of hands that touched it before reaching a packing line. Fresh categories carry some of the tightest margins and the shortest clocks in food retail, and listeria or E. coli concerns in this category move product off shelves within hours of a public advisory.

In an industry where a single recall can consume a year of category profit — industry studies from the Grocery Manufacturers Association and FMI have estimated the average direct cost of a single food recall at roughly \$10 million, before reputational damage — traceability is not paperwork. It is the capability that decides whether a food-safety event is a scoped withdrawal of three lots or a blanket halt across every product a retailer carries. The CDC estimates roughly 48 million Americans get sick from foodborne illness each year, which keeps traceability and recall speed permanently near the top of every retail buyer's risk agenda. HarvestRow's leadership understood this, but their systems had not caught up to their customers' expectations.

02 Where Things Stood

Before Emerson Technology engaged, traceability at HarvestRow lived in paper harvest logs, faxed packing lists and incompatible spreadsheets maintained separately by packing facilities. A lot's journey from field to dock passed through five or six record-keeping traditions, none of them digital in a way that could be queried. When the company ran its last mock recall, tracing one suspect lot to its origin and destinations took six days of phone calls, ledger hunting and spreadsheet archaeology. Six days is an eternity in fresh produce, where a real recall decision has to be made while product is still moving through distribution.

Cold-chain management was nearly as opaque. Temperature excursions inside refrigerated transport were invisible until a store receiver rejected product, which meant HarvestRow absorbed the loss weeks after the actual failure and rarely learned which lanes or carriers were responsible. Waste across the cold chain ran 11% of shipped volume, a figure the finance team tracked but could not attack because the data that would identify root causes simply did not exist at lot level. Store rejections arrived as credit memos, not as diagnosis.

The pressure to change was external and specific. A new FDA traceability rule raised the compliance bar for leafy greens and other high-risk foods, and two national retailers — household names that together represented enormous category volume — made digital farm-to-shelf traceability an explicit condition for listing awards worth an estimated \$3.2M annually. HarvestRow could not bid for that shelf space with paper logs. Meanwhile its smaller grower partners, many of them family operations with workers who log harvests in Spanish, needed any new system to be simpler than the paper it replaced, or it would fail exactly where traceability matters most.

03 The Challenge

The challenge was architectural before it was technical. Traceability data existed at every hop — harvest, packing, cold chain, distribution, store delivery — but no identifier joined the hops together, and no party trusted anyone else's records. Each handoff was a place where the record went dark: a pallet left a field with one lot code and arrived at a packhouse under another; a production run blended multiple lots; a shipment mixed cases from different runs. Reconstructing a single case's history after the fact was manual detective work, and the company effectively had no end-to-end view of its own supply chain.

There was a human dimension as well. Growers range from sophisticated agribusinesses to small family farms, working across two languages and patchy cellular coverage, and any system that made field logging harder than a paper log would quietly die at the point of capture. The compliance team needed FDA-ready reporting without a fresh fire drill each time, the sales team needed traceability to function as a selling asset in retail negotiations, and operations needed the cold-chain visibility it had never had. One system had to serve all three without asking anyone to become a blockchain expert.

04 Discovery and Diagnosis

Emerson Technology began with a two-week discovery sprint that mapped one product family — bagged salads — from field to shelf entirely on paper, before any technology was chosen. The exercise exposed every handoff where records went dark, which partners controlled which data, and what a workable shared data model would have to capture. The audit found that HarvestRow already owned most of the raw ingredients: harvest dates and field identities existed on paper, packing records existed in spreadsheets, and shipment data existed in the ERP — the pieces simply never spoke to each other. Walmart's widely cited pilot with IBM Food Trust, which reportedly traced a package of mangoes to its originating farm in 2.2 seconds after tracing had previously taken nearly seven days, gave the leadership team a concrete picture of what the end state could look like.

The diagnosis also settled the standards question early. The team recommended adopting GS1 identifiers and EPCIS event conventions for lots, locations and events before selecting any ledger software, because proprietary identifiers would lock the company into a vendor and block the retailer integrations that made the project worth doing. Field research with growers surfaced the two non-negotiables for adoption: the capture app had to work offline in areas with weak signal, and it had to work in Spanish and English equally. Finally, the audit confirmed that cold-chain sensor data was the cheapest high-value addition — IoT temperature loggers were already in partial use, but their readings never attached to shipment records where they could be acted on.

05 The Solution

Emerson Technology designed the system around GS1 identifiers and EPCIS event data, then anchored every harvest lot, packing event and shipment on a permissioned blockchain ledger — Hyperledger-style infrastructure where each supply-chain partner sees only its own transactions while all parties share one tamper-evident version of the truth. The architecture has three layers.

The shared data model

Every physical event — a harvest, a receipt at the packhouse, a production run, a shipment, a store delivery — becomes an EPCIS event keyed by GS1 identifiers, so the same lot code follows product from field to shelf without translation. The permissioned ledger guarantees that once written, no event can be quietly edited, which is precisely the property that makes the record credible to retailers and regulators. Each partner sees only its own transactions plus the linkage events it needs, which addressed the confidentiality concerns that had stalled earlier data-sharing attempts. Nightly exports into HarvestRow's ERP keep finance reconciliation aligned with the operational record.

Field capture

Growers log harvest lots through an offline-capable mobile app built in Spanish and English from the first wireframe, with large touch targets and a flow designed to take less time than the paper log it replaced. Lots are captured in the field, queued locally where signal is weak, and synced automatically on reconnect — because a traceability system that fails at the moment of harvest has failed everywhere. Packing facilities link incoming lots to production runs through a scanning workflow, so blend events that once obscured history now explicitly record which lots went into which run. This was the least glamorous layer of the system and, by the team's own assessment, the one that decided whether the whole program would live or die.

The recall console and cold-chain layer

Retailers scan case-level QR codes that resolve to a full farm-to-shelf history in seconds, which turns traceability from an internal compliance artifact into a selling point at the negotiating table. A recall console queries the shared ledger directly, returning affected lots, distribution paths and store destinations in minutes rather than the six days the paper process required. IoT temperature sensors append cold-chain readings to each shipment record, so excursions surface at the receiving dock — with the specific lane, carrier and lot identified — instead of appearing weeks later as store rejections with no forensic trail. Everything runs on AWS, with access controls mapped to each partner's role in the chain.

06 The First 90 Days

The rollout began with the data model, not the software. Weeks one and two finalized the GS1 and EPCIS conventions across HarvestRow's internal teams and its three largest grower partners, and named a data owner at every hop — farm, packhouse, cold chain, distribution center — because the audit had shown traceability fails at unowned interfaces, never at the ledger. Weeks three through six shipped the first version of the grower app to a pilot group of twelve growers spanning all four countries, with the offline queue and bilingual interface tested in the field under real harvest conditions. Early feedback changed the app twice: workers wanted one-handed capture, and a confusion between field codes and lot codes had to be designed away.

Weeks seven through ten connected the packing facilities, linking lot intake to production runs and establishing the case-level QR workflow on two packing lines. The recall console arrived in weeks eleven and twelve, followed immediately by the first monthly mock recall under the new system. That drill traced a suspect lot to its grower, pack dates and distribution path in under twenty minutes — not yet the eventual four, but a two-hundred-fold improvement over six days, and the moment the compliance team stopped treating recalls as projects.

Adoption was managed as an engineering requirement. Every grower received onboarding in their preferred language, a laminated quick-reference card for the truck, and a phone line staffed during harvest windows. A named data owner at each facility reviewed record completeness weekly, and gaps were treated as process defects rather than partner failures. The team published adoption and mock-recall times to leadership monthly, which kept funding stable through the eight months of full grower onboarding. By the end of the first quarter, the question inside the company had shifted from "will growers use this" to "how fast can we extend it to every product family."

07 The Results

A year after launch, the gains were written in operational records rather than slide decks. A follow-up mock recall traced a suspect lot to its grower, pack dates, shipping routes and affected store list in four minutes — down from six days. Both national retailers awarded the listings they had conditioned on digital traceability, worth an estimated \$3.2M in annual revenue, and the sales team now presents verified farm-to-shelf history as a standard part of its pitch. Cold-chain waste fell from 11% to 9% as temperature data exposed the worst lanes and carriers, and the worst offenders were corrected or replaced. Grower onboarding took eight months across all 240 partners, with the mobile app's bilingual, offline-first design credited for 96% adoption.

METRIC	BEFORE	AFTER
Mock recall tracing	days	minutes
New retail revenue	-	+\$3.2M
Cold-chain waste	11%	9%
Grower app adoption	-	96%

The intangible gains compounded the measured ones. The compliance team now treats FSMA 204 reporting as a query against the ledger rather than a quarterly scramble, and monthly mock recalls continue with published times, keeping the muscle warm for the day a real event arrives. Grower partners report that the app is faster than their old paper logs, which is the only endorsement that matters at the point of capture. Retail buyers, for their part, have begun asking for the traceability view proactively, and the program has become a template the company is extending to its cut-fruit lines.

08 What Your Business Should Do

HarvestRow's playbook is repeatable, and it begins on paper. Map one product family end to end — trace a single product from field to shelf by hand before buying any technology, because the exercise exposes every handoff where records go dark and defines your data model. Adopt GS1 identifiers and EPCIS conventions before choosing any software platform, since proprietary identifiers lock you into vendors and block the retailer integrations that create commercial value. Choose a permissioned ledger, not a public chain: suppliers will never log data to a public network, while a permissioned one preserves privacy and still yields a single tamper-evident truth. Make grower entry offline-capable and bilingual from the first release, because field workers log harvests in weak-signal areas and often in Spanish — that design decision is the difference between 30% and 96% adoption. Attach cold-chain data to every lot so temperature excursions surface at the receiving dock rather than as store rejections weeks later. Run monthly mock recalls and publish the elapsed times to leadership, because the muscle matters more than the technology on the day a real event hits. Sell traceability as a listing asset, packaging the farm-to-shelf story for retail buyers alongside price and quality — verified provenance is now winning shelf space in premium categories, not merely satisfying regulators. And assign a data owner at every hop, naming the person accountable for record quality at each handoff, since traceability fails at unowned interfaces, never at the ledger. The stakes justify the effort: the CDC estimates roughly 48 million foodborne illnesses a year in the US, and industry studies place the average direct cost of a single recall near \$10 million.

Before you commit to a platform, sit with the questions HarvestRow's leadership had to answer honestly. If regulators called tomorrow about one lot, how long would it take you to name every store that received it? How many of your growers can submit records from the field today, and in what language? What would winning one national retail listing be worth to your company this year? Where do your traceability records go dark — at the packhouse, the cold chain or the distribution center? How much cold-chain waste would you eliminate if

temperature excursions surfaced at the dock instead of the shelf? Would your customers pay for provenance, or do you see traceability purely as compliance insurance? Take these through the action checklist in this practice book with your team, and ask them again each quarter as your sourcing network and your customers' requirements evolve.

REAL-WORLD PROOF & BENCHMARKS

Walmart's widely cited pilot with IBM Food Trust reportedly traced a package of mangoes to its originating farm in 2.2 seconds — a process that previously took nearly seven days. - IBM Food Trust pilot

The CDC estimates roughly 48 million Americans get sick from foodborne illness each year, keeping traceability and recall speed near the top of every retailer's risk agenda. - CDC

Industry studies from the Grocery Manufacturers Association and FMI have estimated the average direct cost of a single food recall at roughly \$10 million, before reputational damage. - GMA / FMI study

THE PRACTICE PAGES

The 8-action checklist

Work through the list with your team. Tick each box as your organization completes the step, and fill in an owner and a target date so every action has a name and a deadline.

☐**1. Map one product family end to end**

Trace a single product from field to shelf on paper before buying any technology. The exercise exposes every handoff where records go dark and defines your data model.

OWNER

TARGET DATE

STATUS

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☐**2. Adopt GS1 identifiers before any ledger**

Standardize lot codes, locations and event types on GS1 and EPCIS conventions before choosing software. Proprietary identifiers lock you into vendors and block retailer integrations.

OWNER

TARGET DATE

STATUS

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☐**3. Choose permissioned, not public, blockchain**

Suppliers will never log data to a public chain. A permissioned ledger gives each partner privacy while preserving one shared, tamper-evident version of the truth.

OWNER

TARGET DATE

STATUS

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☐**4. Make grower entry offline and bilingual**

Field workers log harvests in areas with weak signal, and often in Spanish. An offline-capable, bilingual app is the difference between 30% and 96% grower adoption.

OWNER

TARGET DATE

STATUS

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☐**5. Attach cold-chain data to every lot**

Stream cold-chain sensor readings onto each shipment record so temperature excursions surface at the receiving dock, not when stores reject spoiled product after weeks in transit.

OWNER

TARGET DATE

STATUS

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☐

6. Run monthly mock recalls, publish times

Practice recall tracing monthly and circulate the elapsed time to leadership. The muscle matters more than the technology on the day a real event hits.

OWNER

TARGET DATE

STATUS

☐

7. Sell traceability as a listing asset

Package the traceability story for retail buyers alongside price and quality. Verified farm-to-shelf data is now winning shelf space in premium categories, not merely satisfying regulators.

OWNER

TARGET DATE

STATUS

☐

8. Assign a data owner at every hop

Name the person accountable for record quality at each handoff — farm, packhouse, cold chain, DC. Traceability fails at unowned interfaces, never at the ledger.

OWNER

TARGET DATE

STATUS

AFTER THE CHECKLIST: OUR TOP 3 PRIORITIES

From the eight actions above, write down the three you will start first - and the single number you expect each one to move. Three priorities with owners beat eight without any.

PRIORITY 1 NUMBER IT SHOULD MOVE	PRIORITY 2 NUMBER IT SHOULD MOVE	PRIORITY 3 NUMBER IT SHOULD MOVE
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THE PRACTICE PAGES

Reflections for your team

Use these questions in your next planning session and type short answers into the boxes. The gaps you find are usually the fastest wins.

Q1. If regulators called tomorrow about one lot, how long would it take you to name every store that received it?

Q2. How many of your growers can submit records from the field today, and in what language?

Q3. What would winning one national retail listing be worth to your company this year?

Q4. Where do your traceability records go dark — at the packhouse, the cold chain or the distribution center?

Q5. How much cold-chain waste would you eliminate if temperature excursions surfaced at the dock instead of the shelf?

Q6. Would your customers pay for provenance, or do you see traceability purely as compliance insurance?

THE PRACTICE PAGES

My 90-day plan

Finish the session by committing to a plan. Three phases, one goal each, one number that tells you it worked. Bring this page to your next leadership review - or to a free consultation with Emerson Technology, and we will pressure-test it with you.

Days 1-30 Focus: audit and alignment

PRIMARY GOAL**KEY ACTIONS****HOW WE MEASURE SUCCESS****OWNER**

Days 31-60 Focus: build and prove

PRIMARY GOAL**KEY ACTIONS****HOW WE MEASURE SUCCESS****OWNER**

Days 61-90 Focus: scale and measure

PRIMARY GOAL

KEY ACTIONS

HOW WE MEASURE SUCCESS

OWNER

Tip: save a copy per team so each group keeps its own answers. Revisit the reflections every quarter - the questions stay the same even as the numbers move.

BOOK THE REVIEW BEFORE YOU CLOSE THE BOOK

Plans without a review date drift. Before you close this practice book, agree on when you will come back to these pages, who will run that session, and when you will check the numbers again. If you want an outside pair of eyes, bring this page to a free consultation with Emerson Technology and we will pressure-test the plan with you.

REVIEW DATE	REVIEWED BY	NEXT CHECK-IN
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Ready for a transformation like HarvestRow Foods's?

Emerson Technology designs and builds the data, AI, cloud and automation systems behind results like these. On a free consultation call we will map this exact playbook to your business - your data, your constraints, your numbers.

Book a free consultation

support@emersontechnology.com

or start online: emersontechnology.com/contact