Farm to Plate®

FISH MONGERS

ACHIEVES

SEAFOOD VISIBILITY WITH
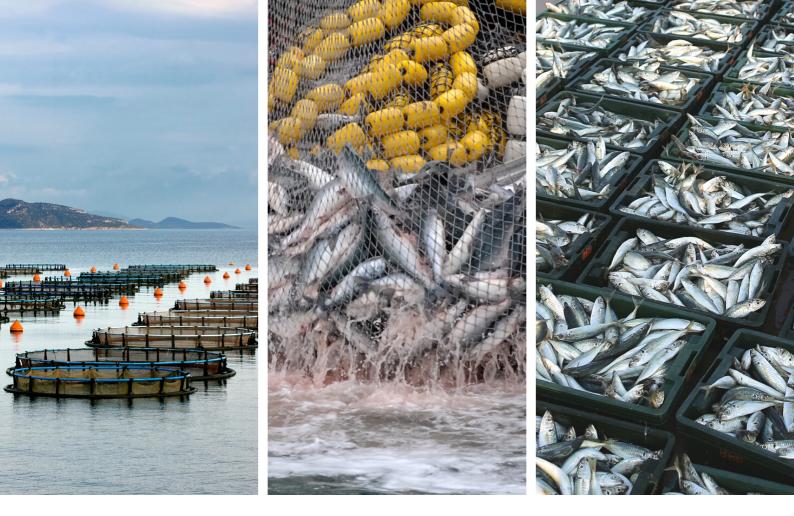# FARM TO PLATE & HYPERLEDGER FABRIC

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"Changing lives."
Those two words
encapsulate the spirit
of Fish Mongers.

The visionary aquaculture technology company leverages artificial intelligence solutions to empower farmers that grow and harvest seafood. Fish Mongers is committed to promoting sustainability within the aquaculture and interconnected agriculture industries by modernizing production and post-production processes.

Fish Mongers has maximized its impact by working downstream and upstream of the aquaculture space. The rapidly growing brand provides farmers with the technology tools and resources they need to engage in high-quality seafood production, achieve cost-effective distribution, and act as good stewards of natural resources.

Not one to leave stones unturned, Fish Mongers also serves retailers and consumers via its comprehensive food security program. This initiative lends itself to the long-term growth of aquaculture operations while promoting food safety. Fish Mongers is known for its steadfast commitment to its four core values, which include:

Transparency

Service excellence

Social responsibility

Integrity

Fish Mongers dynamic team includes researchers, livelihood leaders, engineers, and aquaculture product sales professionals. These talented individuals have pooled their skills to tackle some of the aquaculture industry's most significant challenges.

Fish Mongers- Solving the Seafood Industry's Greatest Challenges

While Fish Mongers has encountered and overcome many such challenges since its inception, one of its greatest hurdles has been increasing visibility across the aquaculture supply chain.

The aquaculture supply chain is incredibly complex and diverse. At its heart is a group of passionate local farmers, many of whom lack access to reliable internet. While these individuals are dedicated to producing safe, high-quality seafood, they often lack the necessary tools to promote true supply chain visibility.

The final link of the supply chain includes consumers, who unsurprisingly want to know more about the products they are purchasing. Due to the highly perishable nature of seafood, consumers want to know how fresh their products are, how long ago they were caught and packaged, and where they originated.

This push for food transparency is part of a larger trend centered around increasing consumer awareness.

Modern consumers worldwide want to know more about the goods they purchase, whether they be seafood, produce, electronics, or household items. Specifically, today's consumers want to support brands that engage in sustainable practices and work to preserve dwindling natural resources.

The Need for Traceability

Farmers and downstream seafood suppliers can strengthen their market positioning and brand image using sustainable harvesting practices. However, it is not enough to adopt these practices- they must also find a way to demonstrate their commitment to consumers through an immutable, transparent process.

To further complicate things, Fish Mongers needed to work through cultural and language barriers, as the clients they serve source fresh seafood from local aquaculture operations and farms across the globe.

An overly complex solution would unlikely be adopted within the diverse aquaculture industry. Adoption rates would be particularly low within smaller operations facing technology scarcities and limited internet accessibility, as many do.

That is the problem, or more accurately, set of problems, that Fish Mongers wants to solve through AI-powered tools and leading-edge tracing technology. The pursuit of this goal led Fish Mongers leadership to partner with Farm to Plate and Hyperledger.

Hyperledger- The Ideal Framework

The Hyperledger Foundation is a community founded on open-source principles. It is committed to developing tools, libraries, and frameworks that will support blockchain deployments at the enterprise level.

The Hyperledger Foundation has hosted numerous innovative blockchain products and furthered the traceability efforts of countless businesses in a wide range of industries. This foundation and its works have been particularly valuable to the food traceability space.

The foundation's cornerstone product is Hyperledger Fabric, a pivotal technology that lays the foundation for creating various blockchain solutions and applications.

Hyperledger Fabric supports a modular architecture that allows technologies to be tailored to clients' needs. These attributes make it a plug-and-play solution that is an ideal fit for the needs of Fish Mongers.

Farm to Plate- The Perfect Partner

The third pillar of the partnership is Farm to Plate. Created by award-winning global software developer Paramount Software Solutions. Farm to Plate is revolutionizing how the food and beverage industry manages its supply chain.

While Farm to Plate utilizes multiple technologies to enhance visibility across the food and beverage supply chain, many solutions are centered around blockchain.

Farm to Plate works within clients' existing software framework to facilitate the seamless implementation of complementary technology solutions. This approach expedites the deployment of applications and tools while streamlining the customer's time to value.

Blockchain technology is uniquely suited for Fish Mongers' mission, as the decentralized nature of this solution can create immutable records that provide superior visibility into when and where the seafood is sourced.

Farm to Plate's blockchain solutions are also highly accessible, as the records they generate can be viewed by simply scanning a QR code. This attribute makes them particularly appealing to segments of Fish Mongers' audience that reside in isolated rural communities.

Also worth noting is that Farm to Plate's mission closely aligns with Fish Mongers' vision. Both entities are dedicated to helping suppliers, manufacturers, distributors, producers, retailers, and consumers achieve full supply chain transparency.

Together, the entities strive to positively impact the planet while saving clients time, money, and resources. Fish Mongers leadership identified Farm to Plate as the ideal partner for its food traceability needs. Organizational decision-makers found Farm to Plate's core functions and objectives particularly appealing when seeking a blockchain technology deployment partner.

Trace   **Track**   **Trade**   **Tip**   **Trust**

The core purpose of the partnership between Farm to Plate, Hyperledger, and Fish Mongers is to achieve true end-to-end traceability and visibility in the aquaculture industry.

Historically, traceability and transparency have been largely lacking within this ever-growing sector due to the grassroots nature of aquaculture production. However, Fish Mongers leadership never shies away from a challenge, even one that has mainly gone unsolved for decades.

The Fish Mongers team believes that applying full-stack tech solutions to the aquaculture traceability problem represents the best way of modernizing this critical global supply chain.
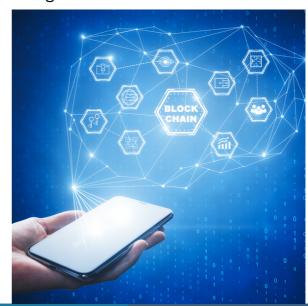
Fish Mongers Knew Blockchain Was the Answer- It Just Needed the Right Partner

Blockchain technologies provide the ideal combination of benefits and capabilities to solve the aquaculture space's traceability problem.

Blockchain ledgers are incredibly secure, facilitate rapid information sharing, provide users with a single source of

truth, and guard against fraud. Additionally, these ledgers can give retailers and consumers a glimpse into the story behind a product, enabling producers to forge powerful bonds with those they serve.

Before connecting with Farm to Plate, Fish Mongers leadership had already identified blockchain as the ideal technology to promote seafood traceability.

Fish Mongers had even connected with a few prospective partners, all specializing in blockchain tech. All of these providers offered subscription-based solutions that could be augmented to meet the needs of Fish Mongers.

However, the Fish Mongers team understands that more than having the right tech is required to solve complex challenges like seafood traceability and transparency issues.

To create a comprehensive tech stack solution that produces measurable results, development partners and project leaders must take the task seriously. Teams can only pool resources to promote sustainability and change lives through ongoing vigilance and methodological refinement.

Another concern among Fish Mongers is that the initial prospects offered no customized solutions. It was counterintuitive to Fish Mongers' standard approach to problem-solving, which involves implementing full tech stack solutions that promote back-end and front-line integration.

To address these concerns, Fish Mongers created solutions that account for every touchpoint along the seafood supply chain to deliver optimal value for clients.

Achieving Synergy with Farm to Plate

With ideals like transparency, efficiency, and manageability firmly in mind, Fish Mongers quickly moved past its first few prospective partners.

Company leaders knew they needed a partner that understood Fish Mongers goals, objectives, values, mission, and beliefs. Farm to Plate is just such a partner.

What stood out the most to company leadership is that Farm to Plate took the

time to listen and learn about Fish Mongers' pain points. Instead of offering a generic, subscription-based solution, Farm to Plate's team expressed genuine interest in solving real-world challenges.

The aquaculture industry is unlike any other. Its supply chain is complex and relies on a broad network of aquaculturists. As such, no off-the-shelf solutions would suffice.

Farm to Plate embraces the versatility and customizability of blockchain.

Both Fish Mongers and Farm to Plate agreed that blockchain represented the catalyst through which they could achieve true end-to-end traceability. They also believed they could craft a solution that every supply chain member, including rural farmers and fishermen, would widely accept.

All that was left to do was choose a flexible framework on which to build the solution.

Farm to Plate and Fish Mongers began exploring several technologies and frameworks, including the full spectrum of blockchain variants. Ultimately, the search led them to Hyperledger Fabric, an enterprise-grade blockchain code base sponsored by the Linux Foundation.

The Hyperledger Fabric provides a level of security consistent with the food and beverage industry standards. It is also mature enough to run in a production environment while yielding a level of performance necessary to support the complex aquaculture supply chain.

Farm to Plate and Fish Mongers agreed that Hyperledger Fabric provides intrinsic benefits unavailable through other blockchain variants. Specifically, this framework offers an assurance of immutability, unmatched transparency, and robust security.

In the end, Hyperledger Fabric was the clear choice for the pair's blockchain foundation.

Overcoming Adoption Hesitancy

Traditionally, the farming industry has been hesitant to adopt auxiliary technologies that do not have a direct, measurable impact on production. The aquaculture subsector is no exception.

After Farm to Plate and Fish Mongers found the perfect framework to build their solution, they needed to explore adoption hesitancy concerns further. Together, the duo devised three key strategies to encourage adoption among producers:

1. Developing a User-Friendly Interface

The entire platform is based on a QR code scanning process. Producers can assign and scan QR codes to effortlessly enter data about when the product was harvested, where it originated, and where and how it was packaged.

The QR code method also easily translates to downstream components of the seafood supply chain. Everyone from suppliers to distributors and retailers can scan package QR codes to update the transactional record of products. This process can be automated in most operations, which further promotes adoption.

2. Breaking Down Cultural Barriers

To afford such accessibility, Fish Mongers and Farm to Plate created a seamless multilingual interface that can display information in dozens of languages. On the back end, Fish Mongers is adding machine translation capabilities to translate local languages into English and vice versa.

The translation capabilities of their full-stack solution will be paired with the QR code software, ensuring that information is translated into the appropriate language as goods progress through the supply chain.

3. Providing Offline Accessibility

Many local fishermen, farmers, and aquaculturists cannot access reliable, high-speed internet. Unsurprisingly, this can cause adoption hesitancy, as they do not want to avoid investing in tools and solutions they cannot consistently use.

Many blockchain applications, especially off-the-shelf options, provide no offline functionality. The applications are useless if users cannot access a high-speed internet connection.

It is one way Farm to Plate and Fish Mongers differentiated their solution- by developing an application that provides full offline functionality. When users are out in the field or on the water away from reliable internet, they can use the application to input data, scan QR codes, and perform a wide range of other tasks.

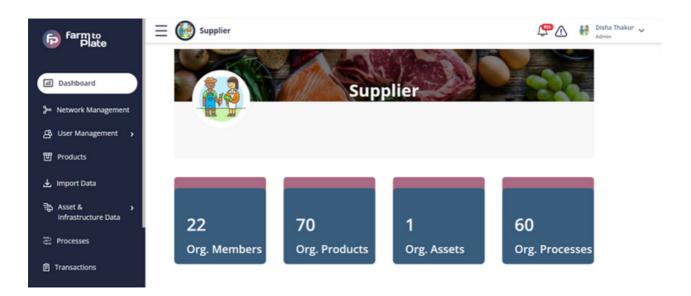## Moving Forward with Their Winning Strategy

If left unaddressed, any of these three adoption barriers could have significantly hindered the viability of the Fish Mongers project. Fortunately, the forward-thinking members of Fish Mongers and the creative, problem-solving minds at Farm to Plate were able to address all potential adoption roadblocks systematically.

Now that the team had identified its primary challenges, they were ready to create an ideal solution. Farm to Plate began by developing a custom blockchain framework using Hyperledger Fabric's architecture.

Parameters	Supplier Side Data	Distributor Side Data	Retailers Side Data
Org Members	22	2	2
Products	70	0	0
Assets	1	1	0
Processes	60	64	22
Transactions	10	2	1

Supplier Side Data

Org Members – 22 I Products – 70 I Assets – 1 I Processes - 60 I Transaction – 10
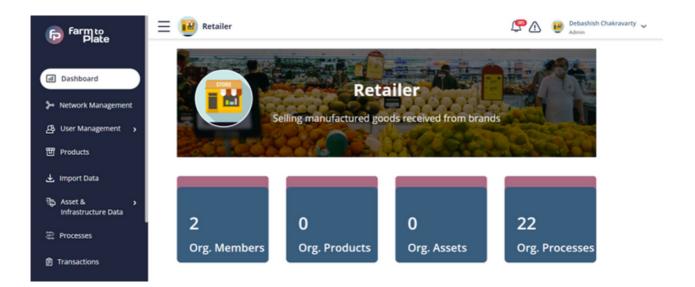
Distributor Side Data

Org Members – 2 I Products – 0 (Since the same supplier product is traveling to downstream participants) I Assets – 1 I Processes - 64 I Transaction – 2

Retailers Side Data

Org Members – 2 I Products – 0 (Since the same supplier product is traveling to downstream participants) I Assets – 0 I Processes - 22 I Transaction – 1

Thanks to Hyperledger Fabrics' "channels" feature, the development team created protected, independent relationships. It promoted better security and created unique channels for each organization using the solution.

Hyperledger Fabric is an open-source project, an attribute that proved especially valuable during the collaboration between Farm to Plate and Fish Mongers. The Fish Mongers team needed to solve a truly one-of-a-kind problem previously considered unsolvable.

When developing the solution, Farm to Plate enhanced Hyperledger Fabric's code base to create customized features addressing Fish Mongers pain points. The company also integrated the application with Fish Mongers clients' existing technology stack, which was perhaps one of the most significant challenges associated with the project.

Farm to Plate: Blockchain-Driven Traceability for All

Farm to Plate leveraged the Hyperledger Fabric to develop a custom solution for Fish Mongers. The deliverable solved several key pain points for the seafood industry and yielded numerous benefits.

Most significantly, the partnership enabled seafood producers to:

Cut Costs

In terms of cost-cutting measures, the Fish Mongers project addresses several sources of resource waste within the seafood industry.

Upstream, the blockchain-based traceability solution enables producers and processors to precisely monitor food storage and harvesting conditions. They can leverage this information to pinpoint sources of waste and other concerns that may lead to excess spoilage.

Downstream, Fish Mongers' blockchain traceability application empowers distributors and retailers to prevent spoilage further and bolster sales numbers.

Promote Food Safety

Promoting traceability and tracking through blockchain does much more than reduce costs. It can also drastically enhance food safety and decrease the likelihood of spreading foodborne illnesses. It does this in several ways.

When food traceability is optimized, producers, distributors, and other supply chain members can detect when seafood is stored outside recommended temperatures.

Upon receiving an alert, they can pinpoint which shipments may have been impacted by the temperature change. They can then verify that the food is still safe, or if it is not, remove it from circulation before it reaches consumers.

Increase Traceability and Transparency

Increasing traceability and transparency in the seafood space is one of the most notable benefits of Farm to Plate's solution. A lack of traceability can hinder sustainability efforts, contribute to food fraud, or create logistical headaches for all supply chain members.

Over the last few years, the unprecedented supply chain challenges have led downstream distributors, wholesalers, and retailers to reexamine how and where they source goods. The seafood industry is not immune to this comprehensive reassessment of the supply chain.

By tracking key products' journeys through the supply chain, downstream entities can identify potential bottlenecks that may threaten inventory levels and use these insights to diversify their supply chain and promote better resilience.

Engage with Customers

One of the most important objectives of the Fish Mongers partnership with Farm to Plate is to give consumers easy access to information about the seafood they purchase. For decades, the only source of information consumers could access was the minimal and generally unrevealing text printed on the product's packaging.

Modern consumers are far more interested in the origins of the products they purchase, especially consumables like seafood. Buyers want to know where a particular product originated, when it was caught and packaged, and whether it was harvested using sustainable practices.

Demonstrate a Commitment to Sustainability

Customers are one of many components of the supply chain concerned with sustainability. Distributors, wholesalers, and retailers also want to know more about the products they buy, including where they are sourced, how they are produced, and whether providers respect natural resources.

Many brands claim to engage in sustainable practices, but they need help proving their commitment to the supply chain's downstream members. Fish Mongers and Farm to Plate can help change that.

Fish Mongers is paving the way for unprecedented transparency and accountability in the seafood industry. In this way, the visionary company is genuinely living out its slogan, "changing lives."

Prevent Food Fraud

Food fraud is a global problem that affects

millions of people every year, deprives businesses of billions of revenue, and damages countless carefully cultivated brands in numerous international markets.

A lack of an immutable, traceable record has long been one of the most damning weaknesses of the food and beverage industry, and fraudsters have exploited this vulnerability for far too long.

While there have been many efforts to combat food fraud, protect consumers, and prevent profit losses, none of these solutions have impacted this criminal trend.

While blockchain has only recently been introduced to the seafood industry, the early results are quite promising. Fish Mongers, Farm to Plate, and other innovators are applying blockchain, AI, and machine learning tools to this decades-old problem.

BLOCKCHAIN

Looking to the Future: Fueling Continued Innovation Through Blockchain and AI

Fish Mongers leadership is thrilled with the results of its partnership with Farm to Plate.

The solution was well-received among Fish Mongers' target audience, primarily producers, fishermen, local harvesters, and aquaculture operations. It demonstrates that Hyperledger Fabric was the perfect framework for building robust blockchain technology.

In the immediate future, Fish Mongers will continue working directly with Farm to Plate to expand its rollout of the blockchain tracing solution.

The goal is to increase user adoption rates further, introduce the product to new markets within the seafood production space, and promote traceability from fishery to consumer.

The early version of the solution far exceeded expectations. It has successfully addressed some age-old pain points facing the seafood industry, including adoption concerns, a lack of an immutable record, and cultural barriers.

However, the Fish Mongers team views this initial success as a precursor for what is to come. Fish Mongers and Farm to Plate intend to expand the solution's capabilities by relying on Hyperledger Fabric's agile framework.

Specifically, the duo plans to:

Optimize Offline Functionality

The Fish Mongers solution already includes a highly useful offline functionality. Users can input data and interact with the application even when internet connectivity is unavailable.

Fish Mongers plans to refine this capability to optimize app performance and ensure users can seamlessly interact with the platform in all conditions and circumstances.

Add Machine Translation Capabilities

Perhaps the most exciting item on Fish Mongers' docket is machine translation. This bi-directional translation tool can translate from local languages to English or vice versa.

A built-in machine translation tool will improve collaboration between producers, processors, suppliers, distributors, wholesalers, and retailers. Such software promises to eliminate adoption barriers further and help Fish Mongers make the application more accessible.

Target New Markets

The seafood market is vast and widespread, spanning hundreds of countries across multiple continents.

During the initial product launch, Fish Mongers was able to make an immediate effect on several precisely targeted markets. It wants to modernize a larger portion of the seafood industry supply chain by breaking into new markets.

Developing Voice Recording Features

Developing voice recording features for the platform will add another layer of engagement and functionality.

These features help streamline the process of documenting harvest information. Additionally, some producers or harvesters can use them to create consumer messages, which is an effective branding strategy.

Implementing GS1 Standards for Traceability

The events/process were manual before Fish Mongers adopted GS1 Standards-based Farm to Plate solutions as their technology enabler. Additionally, the supply chain needed more data-backed information about when the catch was made and transported to the destination retail store for sale. It raised concerns among end-users about the freshness of the seafood they purchased.

The requirement for traceability prompted using a Farm to Plate solution based on GS1 Standards. Any such suspicion would be eliminated with the implementation of traceability and the underlying blockchain technology enabler.

Because the data would be immutable and traceable with date and time stamps about each event that would have occurred on the product before it

reached the hands of the end retail customer through scanning of the QR code present on the product.

GS1 standards provide a common foundation for businesses by uniquely identifying, accurately capturing, and automatically sharing vital information about products, locations, assets, and more. Organizations can use the power of GS1 Standards to use accurate, robust data that allows the right product to be in the right place at the right time and enable consumers to find the products they seek.

GS1 Standards are the foundation for connecting an item with its associated information. It allows customers to track the food they eat from farm to plate, access detailed product information from any device, and save money for businesses by increasing product visibility in supply chains.

Two critical concepts for interoperable traceability are introduced by the GS1 Traceability Standards:
1) Critical Tracking Events (CTEs) are the actual events that occur to the traceable object during its lifecycle, such as receiving, packing, shipping, and transporting.

2) Key Data Elements (KDEs) are data elements that describe the actual instances of the CTEs.

The events or processes associated with these CTEs are connected to the EPCIS Events. EPCIS is the leading data-sharing standard from GS1, enabling visibility within and across an entire supply chain of trading partners and other stakeholders.

It assists in providing "what, when, where, why, and how" of products and other assets, allowing for the capture and sharing of interoperable information about status, location, movement, and chain of custody.

There are six standard events in the GS1 EPCIS realm:

Commission

Aggregation

Disaggregation

Observation

Transformation

Decommissioning

EPCIS Events	CTE Process Names
Commission	Lot Creation Event
Aggregation	Packing and Shipping Event
Disaggregation	Receiving and Unpacking Event
Observation	Quality Check Event
Transformation	Changing a Raw Material to Final Finished Product
Decommissioning	Removing from the supply chain like Recall cases

GS1 Traceability is accomplished through unique identifiers for each product, location, asset, container, lot, and item. The identifiers listed below are generated on the Farm to Plate platform and can be used to identify the material with unique identities created throughout the supply chain.

Identifier	Description	Examples
GTIN	Global Trade Item Number (products and services)	Milk, mangoes, tomatoes
LGTIN	Lot Global Trade Item Number	Batch / Lot of multiple items in a carton
SGTIN	Serial Global Trade Item Number	Individual item unique serial number from a carton
GLN	Global Location Number	Businesses, warehouses, retail stores
SSCC	Serial Shipping Container Code	Logistics units, Pallets, containers
GIAI	Global Individual Asset Identifier	Machinery Equipment, Transportation Vehicles

Farm to Plate uses a GS1 Digital Link to provide verifiable identification to the F&B products onboarded on the platform. Additionally, the GS1 Global Traceability Standard i2 framework to design an interoperable supply chain traceability system.

Smart Labels are produced by Farm to Plate as QR codes that uniquely identify a product's batch/lot or the items in a batch/lot. It contains all the information related to the product and its journey.

Farm to Plate is generating LGTIN, SGTIN, and SSCC smart labels. You have quick and simple access to comprehensive product information with SmartLabels. A Smart Label is a highly flat item identification label that provides the information captured in a QR code and its unique identifications.
The Farm to Plate platform allows you to generate Smart Labels through QR codes. LGTIN, SGTIN, and SSCC smart labels are examples of identifiers that can be used.

LGTIN and SSCC smart labels will provide information about the internal supply chain, whereas SGTIN smart labels can be scanned and viewed by any public user.

Fish Mongers and Farm to Plate: Reshaping the Seafood Supply Chain

The partnership with Farm to Plate provided Fish Mongers with a custom, sophisticated solution built on Hyperledger Fabric's open-source, tailorable framework. The culmination of this partnership is an easy-to-adopt, rapidly deployable blockchain solution with the potential to have a lasting influence on the seafood supply chain.

In the coming months, Fish Mongers anticipates being able to launch a host of major technical features, enhancements, and capabilities that will

further promote adoption in the seafood producer space. Later platform iterations will be faster, more dynamic, reliable, and laden with value-oriented features.

The blockchain framework provides the seafood industry access to the secure, immutable transactional recordkeeping system it has been seeking. Due to its multilingual capabilities, this solution is not hindered by cultural or language barriers, borders, or the rigidness of traditional recordkeeping solutions.

The vision for the Fish Mongers solution is to accelerate the digital transformation of the seafood supply chain, starting with producers, aquaculturists, fishermen, and farmers. It will set the stage for unparalleled sustainability, supply sufficiency, efficient operations, and optimized productivity.

This evolution's sweeping effects will promote efficiency throughout the seafood supply chain.

Processors, harvesters, wholesalers, distributors, and retailers can contribute to sustainability and natural resource protection. Their cumulative efforts will simultaneously yield a safer, more engaging experience for consumers that support the seafood industry.

Changing Lives, Preserving Ecosystems, Protecting Consumers

Under ordinary circumstances, referring to a piece of technology as "life-changing" would be hyperbolic. But in the case of the Fish Mongers solution, life-changing is inarguably the right term to use.

The blockchain and AI-powered technology bring Fish Mongers closer to realizing its vision and mission centered around developing a sustainable aquaculture industry.

Although the industry is massive, Fish Mongers understands that affecting real change requires a grassroots movement that addresses both ends of the supply chain, producers and consumers. The Farm to Plate/Fish Mongers partnership yielded a platform that does just that.

This solution brings consumers into the conversation like never before. By simply scanning a QR code, they can gain instant insights into the origin of a product. They can learn how it arrived on store shelves, whether its producers practice sustainable sourcing methods, and how their purchase influences communities worldwide.

It is too early to tell just how far-reaching the impacts of the Fish Mongers, Farm to Plate, and Hyperledger Fabric partnership will be. But one thing is certain: this full tech stack solution will influence this global industry for years.