Hologram

Keeping food fresher

How Hologram, Escavox, and Purfresh are improving the global supply chain

One-third of all food grown in the world is never eaten.

United Nations Food and Agriculture Association

Watermelons in winter. Mangoes in Manhattan. Australian lamb in Abu Dhabi.

Modern supply chains bring fresh food from every corner of the world right to your local grocery store, all year long.

In fact, more than 55 percent of the fresh fruit consumed in the United States each year is imported, along with a third of the vegetables[1]. The routes are constantly adjusted to align seasons with demand — not to mention working around droughts, blights, and other unexpected changes.

Growers who want to reach far-flung markets beyond their immediate roads and rail have two options.

Annual global food waste[5]	
1.8	**billion** tons of uneaten food
$750	**billion** in value
3.6	**billion** tons of CO_2 emissions

Footnotes

1. US Food and Drug Administration
2. World Bank
3. Our World in Data
4. Science
5. United Nations Food and Agriculture Association

Via air

Air freight is much quicker, but a World Bank study finds it's 12 to 16 times more expensive than sea[2], while emitting 50 times more CO_2[3]. Traditionally, shippers have relied on air for the most valuable, most perishable products, such as asparagus and berries.

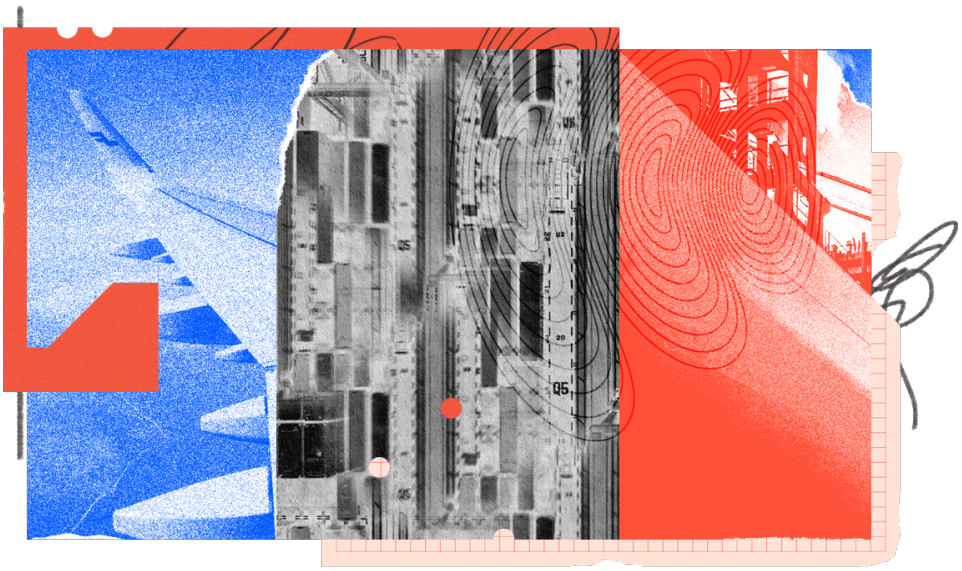
Via sea

Nearly 60 percent of all miles traveled by food are via sea[4]. Cargo ships are cheaper than other options, but it can take weeks to ship grapes from Chile to New York. And the longer it takes, the precious cargo is more likely to rot or decay, ultimately reducing its worth. When it finally arrives, its downgraded condition may fetch a lower price. Or it may be too far past ripe to even sell.

Today's growers try to out-compete each other to deliver the freshest possible produce that will earn the highest prices — with the lowest expenses.

Several companies are using the Internet of Things to harness the power of data to help growers:

- Delay ripening
- Maintain freshness and taste
- Reduce decay and mold
- Improve food safety
- Extend shelf life



Escavox & Purfresh

Monitoring food freshness throughout the journey

IoT sensors are transforming every phase of the global supply chain, from dockside cargo operations to retail shelf inventory. Now two companies are using IoT connectivity to monitor and track the shipping conditions of fresh food as it journeys around the globe.

In Sydney, Australia, Escavox created a cell-phone-sized device that monitors conditions along produce's journey. Escavox's Blue Box tracker goes into produce boxes right at the farm or packer and stays with the produce all the way to the grocery store. Along the way, Escavox continually monitors temperature, light, humidity, and location, while advanced AI-driven algorithms suggest ways to improve freshness.

Meanwhile, San Francisco-based Purfresh has a briefcase-sized device that actively monitors the real-time conditions within sea freight containers, including temperature, humidity, and oxygen, while controlling carbon dioxide levels. Purfresh can remotely adjust the physical container conditions to minimize decay and delay ripening. The Purfresh system extends shelf life further by also generating ozone, which destroys ethylene and mold while reducing the risk of E. coli, listeria, salmonella, and viruses by 99 percent. Maintaining these optimal conditions also reduces the residual pesticide and fungicide on fruit surfaces by 75 percent.

By working together, Purfresh and Escavox help shippers track their goods at every single step of the journey. While Escavox's Blue Boxes track from farm to port, they lose connectivity when placed in steel shipping containers. That's when Purfresh's devices, with transmitters on the outside of the cargo container, take over. And when the shipment reaches its destination port, Escavox's Blue Boxes resume tracking. Through this partnership, growers and shippers have fully automated, real-time data and analytics across thousands of miles of land and ocean.

Challenge

Truly global reliable connectivity

Both Escavox and Purfresh prioritized reliable global connectivity as they developed their devices. In the course of a single voyage, a device may need to connect to dozens of carriers in multiple countries — so the connectivity has to be seamless.

Purfresh's original cellular provider could handle the connectivity, but Purfresh often received astronomical bills for data overages and unused data. The provider also lacked in-depth diagnostics that could help Purfresh quickly identify and resolve issues.

Meanwhile, Escavox's real-time data and analytics hinged on rock-solid reliability — the Blue Box trackers had to stay connected, worldwide. Escavox CEO Luke Wood notes, "Real-time visibility is required by our clients to ensure the best product reaches the consumer."

After all, food supply chains are constantly shifting. Escavox needed assurance that a shipment could connect everywhere, even a first-time port, without inserting a new SIM, reconfiguring the device, or negotiating a new contract. Plus, Wood explains, "Escavox started as a supply chain data specialist with ambitions to grow internationally, so we needed an international partner."

> "Real-time visibility is required by our clients to ensure the best product reaches the consumer.

Luke Wood

CEO, ESCAVOX

Solution

Single-SIM simplicity & reliability

Hologram's global SIM card serves	
470+	**countries** and territories
200	**carriers** worldwide
100,000+	**happy customers**

Purfresh and Escavox independently reached the same conclusion: the simplicity and reliability of Hologram's global SIM gave them everything they needed to keep their customers and their cargo connected and protected.

Hologram developed a global SIM that can be used with 470+ different carriers covering 200 countries. The hardware-agnostic global SIM and IoT connectivity platform allow both companies to install the same SIM card in every single device they produce. Each device then automatically connects to the best available carrier as their devices move between farm, packing house, port, warehouse, and grocery store — with no need for steering or intervention.

Escavox's Wood explains, "During our R&D phase we determined Hologram had the most coverage and location accuracy and were the global leader in terms of size and scale and would be able to support our vision."

Purfresh ran a 3-month pilot with 50 devices to ensure that the Hologram SIM could connect in its most challenging markets for connectivity: South Africa, Australia, Japan, Taiwan, and Vietnam.

Purfresh soon realized that not only was the connectivity reliable, Hologram Dashboard included advanced diagnostics that helped proactively troubleshoot issues.

Grant Shatto, Director of Engineering at Purfresh, says, "I shopped around for quite a while because our fleet is pretty big. When we set up the pilot, I was impressed with Hologram's Dashboard, and specifically the engineering and diagnostic capabilities. Now we have a lot more tracing and we can identify issues before they become a problem to customers."

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Hologram allows us to operate globally, from South Africa to Europe and from Australia to Taiwan.

Grant Shatto

DIRECTOR OF ENGINEERING, PURFRESH

How Hologram keeps Escavox & Purfresh connected

With Hologram, Escavox and Purfresh stay connected to stream data about current conditions, offer recommendations, and even remotely adjust the shipping container's temperature, humidity, or ozone level.

Easy installation and connectivity, worldwide

The global SIM is truly global, with redundancy that ensures each device automatically connects to the strongest carrier. Since deploying Hologram, Purfresh devices have connected with up to 126 different carriers in 54 countries in a single month. And the global SIM is simple to install, so both companies can easily upgrade their device's connectivity. Escavox relies on Hologram Preflight, enabling automated batch activation and configuration that makes it even easier to rapidly expand the fleet.

Constant data flow for better analytics and outcomes

Escavox processes more than 2.5 million daily data points from all corners of the globe, applying the information to continually improve its analysis — and its customers' results. For example, Escavox's supply chain monitoring has helped validate newly developed shelf-life algorithms, giving Australian red meat suppliers the tools to keep vacuum-packed chilled beef fresher for an additional 50 days, and lamb for an additional 25 days. Additional shelf life means Australian red meat exporters have the potential to reach more markets by sea, allowing them to ship higher volumes at a lower cost than airfreight.

New capabilities with Hologram Dashboard and APIs

Both companies are using Hologram Dashboard to monitor their fleets in real time. And it's only getting better. Escavox's Wood says, "The Hologram Dashboard is constantly being improved, resulting in a more streamlined fleet management experience, while the API provides relevant and very useful tools for bulk fleet management activities."

Simplified troubleshooting to keep customers happy

The diagnostics in Hologram Dashboard and Hologram Inflight help proactively resolve potential issues and provide better troubleshooting. As Purfresh's Shatto notes, "If our technicians on the ground in Chile say the lights are on with our device, I can go into Hologram Dashboard and see that it's connected. We can track down and troubleshoot the issue, right in Dashboard."

Per-gig pricing that saves money

Hologram's flexible pricing model means that both companies only pay for the data they actually use, without overages or paying for unused data. And since usage can vary greatly from month to month, that saves money. Purfresh reports saving at least $1,600 a month, or $20,000 a year, simply by pausing unused SIM cards — figures that continue to grow as more devices come online. "With Hologram, we can put limits on all the SIM cards. That minimizes our exposure to really big bills," Shatto says.

If I've got a question, there's always a response. From the get-go, Hologram support has been really awesome.

Grant Shatto

DIRECTOR OF ENGINEERING, PURFRESH

Fresher food with less waste

With more reliable worldwide connectivity, Escavox and Purfresh are helping growers bring fresher food to market while improving the cold chain.

More valuable produce that boosts profits

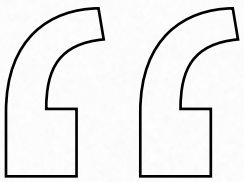
Constant IoT connectivity and analytics help food reach its destination in better condition. That enables sellers to earn a higher price while reducing how many avocados get thrown away, unsold. Purfresh notes that its devices boost shipment value by an average of 275 percent while saving an average of $3,749 per container. Plus, with data at the ready, Purfresh's customers can clear US Department of Agriculture protocols faster, delivering to market (and consumers) sooner.

A smoother supply chain that reduces carbon miles

Escavox's analytics tools track the progress of produce throughout the entire supply chain, including time, temperature, and location. With that data, Escavox can identify where along the route the product faces suboptimal conditions, giving customers intelligence to improve routes or processes. As a result, Escavox customers report an average of 21 percent improvement in "voice of product" scores that measure supply chain performance, including product quality, waste, and carbon miles.

Agility that helps navigate constant change

The only constant in the food supply chain is change. If a freeze wipes out Florida's orange crop, for example, US importers may turn to Brazilian oranges. Or look at what happened as the COVID-19 pandemic unfolded: closed borders, understaffed ports, and changing consumer demand created supply chain chaos. Through it all, Escavox and Purfresh customers could adjust and re-adjust their routes to balance supply and demand without worrying about connectivity.



As we continue to scale up our service overseas, Hologram is centrally placed to facilitate our growth strategy.

Luke Wood

CEO, ESCAVOX

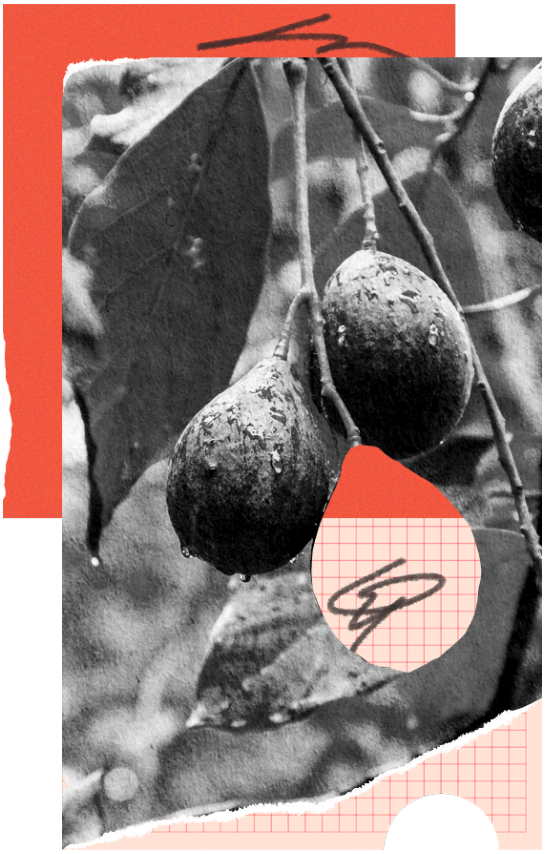
Scalability that unlocks growth

Escavox currently has more than 16,000 devices using the Hologram global SIM, with plans to continue growing. Escavox's Wood says that Hologram's technology is paving the path forward, noting, "We made a move from standard sims to eSIMs for our newest device in order to drive down costs and ensure fleet security." Purfresh is also in the process of rolling out the Hologram global SIM to its entire fleet.

Together, Purfresh and Escavox are continuing to help streamline the global supply chain — keeping food fresher while minimizing waste and emissions.

Avolution

Increasing exports by 30 percent



Escavox customer Avolution uses Excavox's continuous temperature monitoring to ensure its Australian avocados arrive in optimum condition, with less waste. Thanks to Escavox's Blue Box trackers, Avolution was able to switch from air freight to sea freight, increasing exports to Asia by 30 percent while significantly reducing freight costs. And with more confidence in the cold chain, Avolution is now planning shipments to the Middle East and Europe within the next six months.

> "Markets that we once considered out of reach by boat are now well and truly in play.

Antony Allen

CEO, AVOLUTION