



# End-to-End Cold Chain Management for Fresh Fish: Improving Quality, Reducing Waste, and Enhancing Efficiency

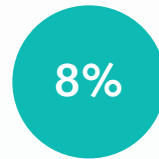
## Key Benefits



Reduction in Shrinkage Due to Mis-shipments



Potential Sales Increase from Better Inventory Visibility



Pallets Identified Outside of the Cooler for more than 30 Minutes

## Executive Summary

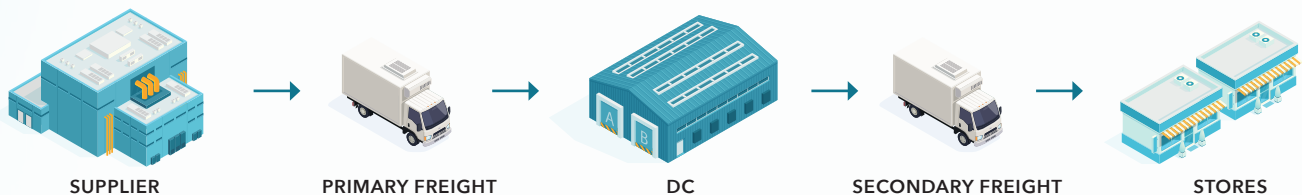
A leading retailer faced significant challenges in managing the cold chain for their seafood, with a particular focus on fresh fish. Their primary objectives were to reduce stock loss, enhance product quality, and improve operational efficiency across their supply chain. To address these challenges, Wiliot’s comprehensive solution was implemented to enable continuous temperature monitoring, real-time inventory visibility, and the automation of manual processes. What set this project apart was the end-to-end visibility that Wiliot’s platform provided, uncovering critical issues from the supplier, through transportation, to the distribution center (DC) and the store. This visibility empowered the retailer to make data-driven decisions at each stage, leading to a noticeable improvement in product quality, a substantial reduction in waste, and the identification of key opportunities to further enhance supply chain and store operational efficiency. Additionally, with labor shortages in stores affecting unloading and cooling processes, the platform’s insights allowed for better labor management, ensuring staff were deployed where needed most.



**You can’t fix what you can’t see**

**Manager**  
Leading Seafood Retailer

### End-to-End Supply Chain Visibility



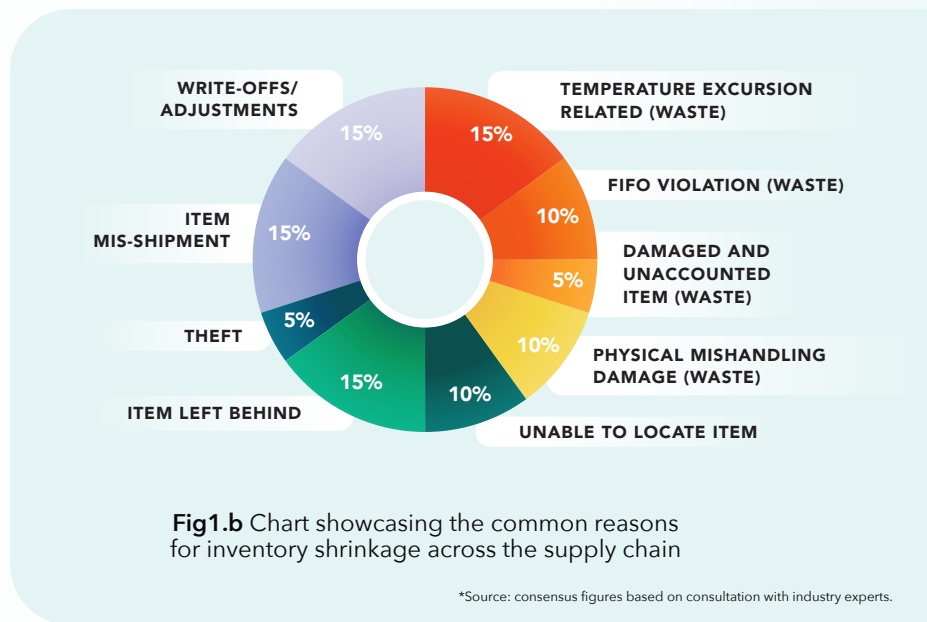
# Introduction

The retailer, known for its commitment to offering high-quality seafood, was dedicated to further optimizing its cold chain management practices to best serve its customers. Despite already surpassing industry average, with over 90% of their fresh fish inventory reaching customers, the retailer aimed to further reduce stock loss. To achieve this, they sought to implement a solution that would allow for continuous monitoring of temperature throughout their entire inventory supply chain, from the supplier through to the store. By leveraging Wiliot's Ambient Data Platform, the retailer was able to gain end-to-end visibility into each stage of the supply chain, uncovering key inefficiencies at the supplier, during transportation, and within the DC. This comprehensive view ensured optimal conditions were maintained in real-time, enabling the retailer to address issues as they arose and prevent them from escalating. The platform also provided opportunities for better managing labor shortages, particularly in stores, ensuring that products were unloaded and stored in a timely manner. This improved inventory management accuracy, ensured effective handling to guard shelf-life, and also enhanced overall operational efficiency by eliminating the need for manual logging and scanning, all without adding any additional labor.



## Challenge

Managing the cold chain for seafood presents significant challenges due to the product's sensitivity to temperature fluctuations. Fresh fish specifically has a typical shelf life of just 11 days. Even minor temperature excursions can drastically reduce this shelf life, shortening it to as little as 3 days. While temperature mishandling can reduce shelf life, leading to markdowns or wastage, this is only a fraction of the broader issue of overall inventory shrinkage.



Inventory shrinkage stems from a variety of factors, many of which directly impact the shelf-life and salability of products. However, some shrinkage occurs because inventory becomes unreachable or unaccounted for within the supply chain due to missing/stolen inventory. These issues, rather than being isolated to a single point, compound across multiple nodes of a typical supply chain.

At the supplier level, compliance with temperature protocols during loading and throughout the primary freight journey is critical. Within the DC, issues such as FEFO (First-Expiry, First-Out) violations and pick errors further contribute to shrinkage. In transit, dwell times and routing inefficiencies were flagged as areas that could impact product quality by the time it reached the store. On average, 20% of store-level issues are a result of upstream mishandling, which often goes unnoticed until it's too late. While around 80% of problems occur downstream due to the larger number of stores compared to distribution centers and suppliers, the remaining 20% happens upstream. Most importantly, these issues often involve continuous or slowly aggregating excursions that begin all the way from the source, compounding as they move through the supply chain. This is why upstream visibility is critical for retailers to protect their bottom line. The retailer experienced a stock loss for several SKUs of fish that, while better than the national average for seafood, still posed significant room for improvement, in terms of cost and impact to customer satisfaction. Customer complaints, or in the worst case, a food safety outbreak, underscored the need for improved quality control and handling procedures.

# Solution

To address these challenges, the retailer implemented Wiliot's Ambient Data Platform, which provided end-to-end visibility and control over their seafood supply chain. This solution tracked seafood from the supplier, through transit, to the distribution center (DC), and finally to the store, delivering real-time, case-level temperature, location, and inventory level data.



## Potential Shrinkage with Wiliot

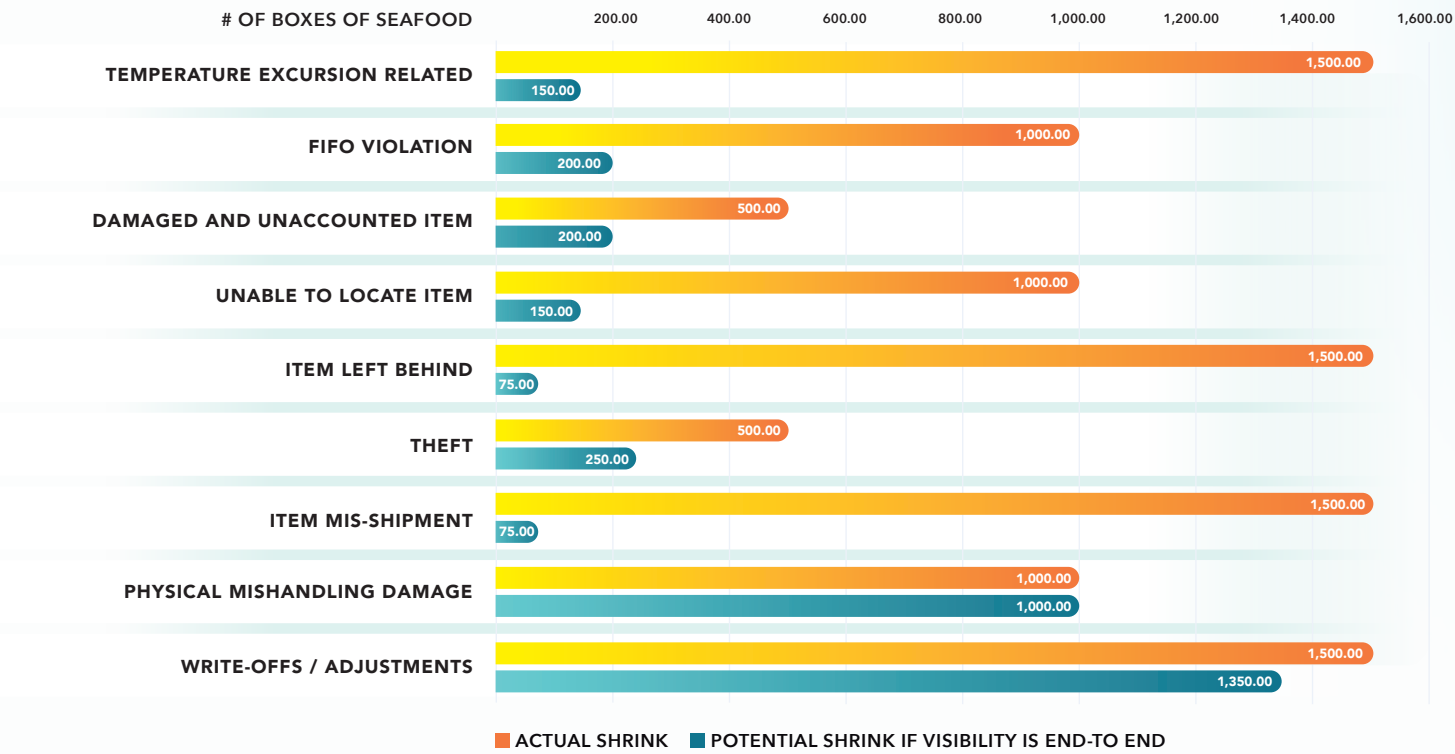


Fig 1.c this graph depicts the level to which the Wiliot solution can bring down the various categories of shrink depicted in Fig1.b-considerng a shrink of 10,000 units

Wiliot's real-time visibility throughout the supply chain was instrumental in addressing and reducing the various causes of shrinkage. By strategically establishing visibility from the source - covering every stage from the supplier, in transit, to the distribution center, to the store - the retailer could monitor temperature compliance during loading and transportation, ensure accurate inventory counts upon receipt at the DC, and track the movement of stock to the store. This end-to-end visibility uncovered key areas where the retailer could make improvements, such as addressing transportation delays, optimizing the use of FEFO practices in the DC, preventing product misplacement in-store, and labor-related inefficiencies, such as delays in unloading due to staffing shortages. This comprehensive tracking and monitoring provided insights that make a significant impact on reducing shrinkage and daily opportunities for the retailer to improve product quality and operational efficiency.



## Key Areas of Focus

### Continuous Temperature Monitoring

Wiliot's platform provided real-time temperature monitoring throughout the supply chain, effectively identifying excursions and triggering alerts for immediate corrective actions. This proactive approach significantly reduced the risk of spoilage, ensuring that the product maintained its quality throughout its journey. For example, the platform detected 4% of pallets are not moved to refrigerated storage for over than 60 minutes, potentially compromising the shelf-life and visual appeal of the fresh fish. Immediate actions were taken to rectify these issues, such as optimizing the timing of pallet picking to ensure that the fish remained at the top and in the best possible condition. Additionally, temperature protocol issues during primary and secondary freight journeys were flagged, allowing the retailer to work with transportation vendors to address and resolve these issues. Furthermore, workflow adjustments were made, a testament to this customer's relentless drive towards better product handling.



#### Key Opportunities for Enhancing Temperature Control

**Immediate Alerts:** The system triggered alerts before the pallet had been out of refrigeration for 60 minutes, allowing the team to take swift corrective action.

**Process Adjustments:** Adjustments included ensuring a sufficient staff were available to move shipments into coolers immediately upon arrival and restructuring pallets for immediate restocking, placing fish at the top to avoid prolonged exposure on the sales floor.



## Inventory Visibility & Accuracy

The Wiliot platform also provided real-time visibility of merchandise from source to destination, which was pivotal in reducing discrepancies (disputes and commercial claims between the retailer and its suppliers) and enabling more accurate and efficient inventory management. Visibility at the supplier level allowed the retailer to track the quantity of cartons dispatched, ensuring that inventory was accounted for from the very beginning of the supply chain. Additionally, the platform enabled tracking of lot IDs by case, which is crucial for traceability. In the DC, the platform helped automate the receipt of cartons, reducing disputes related to missing or miscounted inventory and improving FEFO accuracy.

## Operational Efficiency

Wiliot's platform automated several manual processes that were previously time-consuming and prone to error. For instance, the platform automated both temperature collection and inventory checks upon receipt in their Warehouse Management System (WMS), significantly reducing errors, omissions, and labor inefficiencies. Eliminating a 10-second task per case of scanning could result in millions of dollars saved in man-hours. Additionally, the platform had the potential to save tens of millions more in man-hours by automating manual inventory tasks and the search for missing or misplaced items. The platform's ability to identify and address labor shortages further improved operational efficiency by ensuring that products were promptly moved to coolers, avoiding unnecessary delays. The platform also identified and addressed non-compliant processes within the supply chain. This included spotting delays in stocking and incorrect stock placements, allowing the retailer to proactively address these inefficiencies.



### Key Opportunities for Enhancing Inventory Visibility & Accuracy

**Inventory Accuracy:** Utilize real-time data as an audit point against expected inventory counts, with options to update records or correct the process in real-time.

**Location and Expiry Monitoring:** Reduce waste and increase the likelihood stock is placed in the correct location while adhering to the FEFO (First-Expiry, First-Out) method, ensuring older goods are prioritized for stocking first, thereby reducing waste caused by expiry.



### Key Opportunities for Improving Operational Efficiency

**Alerts for Picking Errors:** Implement immediate alerts for picking errors at the distribution center (DC), with options to update records or correct the process in real-time.

**Process Adjustments:** Utilize insights to identify and address the root causes of delivery times that fall outside the expected window, improving transport efficiency and instore workforce management.



## Results and Findings

The implementation of Wiliot's Ambient Data Platform led to several key outcomes:

- ✔ **Quality Improvement:** Insights from the project revealed opportunity for reducing seafood customer complaints and returns by maintaining more consistent product quality and addressing temperature-related issues.
- ✔ **Waste Reduction:** Continuous monitoring, all the way from the source to the store, and timely alerts helped reduce stock loss, with 4% of pallets identified for corrective action, therefore reducing overall shrinkage.
- ✔ **Operational Efficiency Increase:** The retailer saw improvements in inventory accuracy, reduced error prone manual labor, and the automation of key processes, leading to fewer delays and more efficient supply chain operations. The platform provided opportunity to reduce stocking labor effort.
- ✔ **Boosted Sales from Better Inventory Visibility:** Enhanced inventory visibility to improve annual sales by 4-8%. (<https://www.ecrloss.com/research/grow-sales-by-improving-inventory-records>)
- ✔ **Enhanced ROI Through End-to-End Tracking:** The end-to-end tracking implemented through Wiliot's platform unlocked a wealth of new insights, allowing for root cause analysis of problems, and rectifying issues before they grow into bigger problems. The retailer can achieve a 28% increase in ROI, demonstrating the significant value generated by the platform, with only a 6% increase in costs.
- ✔ **Visibility and Control:** As one manager aptly noted, "You can't fix what you can't see". The continuous real-time tracking provided by Wiliot's platform gave the retailer clear visibility into the complexities of the fish supply chain, and the confidence to identify and promptly address any issues that arose.

### Potential Shrinkage at Different Levels of Visibility

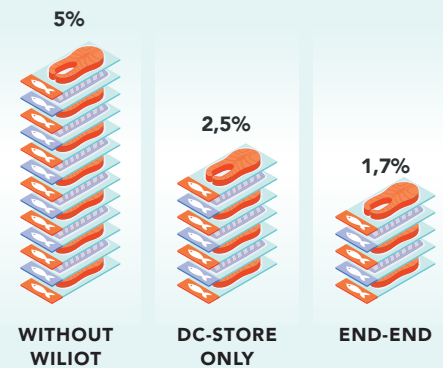


Fig1.d This graph depicts the potential reduction of shrinkage at varying levels of visibility

### ROI & Cost Growth at Various Levels of Visibility

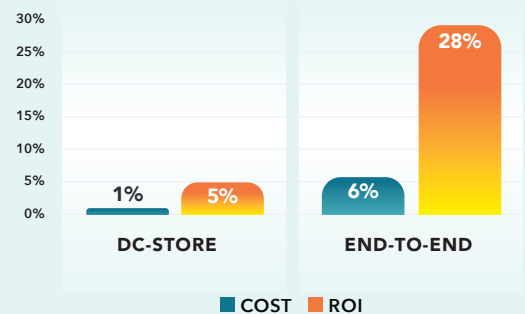


Fig 1.e This graph depicts the potential impact of implementing the Wiliot solution all the way from supplier to store instead of just their DC storage – their cost goes up by 6% whereas the potential ROI grows 28%



## Conclusion

Wiliot's Ambient Data Platform drove value for the retailer, delivering significant improvements across their seafood supply chain. The implementation of the platform enabled the retailer to significantly reduce stock loss, enhance the quality of their seafood products, and improve operational efficiency. By providing continuous temperature monitoring, real-time inventory visibility, and automating key processes, the platform not only addressed existing challenges but also created new opportunities for optimization.

Looking ahead, the retailer can continue to refine and enhance their processes through ongoing data analysis and further automation. This will allow them to sustain and continue to build upon the improvements they have already achieved, ensuring their supply chain remains resilient, efficient, and capable of delivering the highest quality products to customers.

Strategically, these advancements align closely with the retailer's broader objectives of sustainability, customer satisfaction, and operational excellence. By positioning themselves as a leader in quality food management, they are well-equipped to meet the demands of an increasingly competitive market while maintaining the trust and loyalty of their customers.



### About Wiliot:

Wiliot's Ambient Data Platform, leveraging battery-free IoT Pixels, is transforming manufacturing, distribution, and product use by enabling a new level of real-time awareness for every single thing.

**Visit [www.wiliot.com](http://www.wiliot.com) to learn more**