



## Global Consumer Packaged Goods Company Improves Yield through Real-time Insights

### One of the World's Leading Consumer Goods Companies

This FogHorn customer is one of the top five consumer packaged goods (CPG) companies in the world with tens of billions in sales. Their products span multiple categories and brands and they operate manufacturing facilities around the globe to meet demand from consumers.

### Challenged to Improve Production without Reprogramming PLCs

For all CPG companies, minimizing scrap and improving yield is critical to maintaining operational margins and assuring satisfied customers. In the volatile market of consumer goods with shifting consumer brand preference, it is vital that manufacturing operations be controlled as tightly as possible to soften the effects of changing demands.

This CPG company saw an opportunity to improve operations in one of its packaging plants. The facility produces single-use containers, fills the containers with product, and then packages several containers together in a larger package to be sold in stores. Depending on the variation of the product, the spec for each container varies.

This FogHorn customer's automated packaging system and programmed logic controller (PLC) were designed to fill each container based on weight. However, weight is just a proxy for the trade secrets the machine operator uses to also account for volume and compression. When raw product is dispensed from the tank into each container, this packaging function must account for all these variables with a simple measurement, while also considering how much of the product has been used.

### Challenges

- Errors in filling consumer product packages to specification
- Lack of real-time insight into production line performance
- Do not want to reprogram PLC logic

### FogHorn Solution

- FogHorn Vel™ for data clean-up, enrichment, analytics
- FogHorn Viz for real-time data visualization and time series database for persistence
- Real-time operator notifications when product packages out of spec

### Benefits

- Improved yield
- Dramatic data reduction
- New insights for future product improvements

Before FogHorn, this CPG company would pull product weight samples once or twice an hour from their data historian. Volume settings would frequently be adjusted to ensure proper weight, and the final packaged product would also be sampled for accuracy. Any errors in weight that the customer was able to catch during sampling would result in scrapped product and a resulting impact to margins. Errors that were not detected led to out-of-spec product getting to market.

The customer perceived reprogramming their PLC logic as too risky; changes to the PLC are often disruptive to productivity and can have detrimental effects on operations. Ladder logic programming requires specialized skills and is expensive to hire, all of which makes it nearly impossible to do fast iterative learning. This customer was also sensitive to streaming sensitive product data to a third party cloud because of stringent security and governance requirements.

### Real-time Analysis Reduces Out-of-spec Packages

This FogHorn customer's complex packaging process required a real-time solution to expose new intelligence on the factory floor. The solution had to operate fast enough to identify defective product while it was still on the production line and perform compute-intensive calculations and operate entirely on the factory floor, ensuring the company's security posture and data governance requirements were met.

This worldwide CPG leader brought in FogHorn to provide a real-time IIoT system for data ingestion, clean-up, enrichment and analytics. The machine operators were able to script their analytics in FogHorn Vel™ expressions. Vel is a Pythonic, SQL-ish, English reading-like platform explicitly written for low-footprint, low-latency (milliseconds) advanced edge IIoT

analytics. Vel was designed from the ground up to enable not only powerful and highly complex analytic expressions to be executed on streaming data (like a turbocharged dynamically programmable rules engine), but Vel also cleans, filters, normalizes and aligns streaming data to allow any ML or AI models to be executed on the real-time processed metadata. Vel can be programmed by data scientists and written with a graphical interface by plant operators.

With a robust edge analytics solution in place, this customer's packaging system was scaled to run 16X more scales in parallel to increase the volume of sampled data and at more frequent intervals. The scale measures feed into FogHorn and algorithms extract instantly how the packages are doing on a statistical basis. In real-time, notifications are sent to operators using FogHorn VIZ for real-time data visualization with zero disruption to the PLC or existing ladder logic. Because this compute is done at the edge, this customer was able to avoid having sensitive data leave the factory floor and create a security risk. In the future, this customer will explore using FogHorn to send alerts and changes directly to control systems.

After implementing FogHorn, this CPG customer was able to make an appreciable impact on finished product scrap and boost the factory's yield and operational margins. The production team now has an entirely on-prem edge system in place that allows for continual learning and refinement of their processes, driving future product and process improvements.

**"FogHorn set the tone early in edge intelligence and machine learning for IIoT by shifting the mindset of "cloud first" to "edge first. Now, you can see it extending its leadership position with "edge to cloud" to deliver the most powerful and cost effective approach to edge AI for industrial organizations."**

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