

A Proactive, Collaborative, and AI-driven Approach to Predictive Labor Resourcing

CSW Success Story

How Datex and Endeavor Labs leveraged AI and machine learning to produce effective predictive models for labor scheduling and throughput.

ABOUT THE CLIENT

Central Storage & Warehouse (CSW), a third-party cold storage warehouse provider, provides temperature-controlled storage environments for food products and other industries requiring customized cold storage solutions, focusing on food preservation and specialty storage needs with personalized service and modern refrigeration technology.

THE CHALLENGE

CSW needed a proactive approach to forecast labor availability on an hourly basis, schedule loads to mitigate peaks, and prioritize work to maximize its workforce across daily shifts.

Its main goal for this initiative was to optimize staffing, scheduling, and warehouse performance by leveraging AI-enabled predictive analytics paired with an informed, data-driven strategy.

THE SOLUTION

As part of an AI-driven labor optimization strategy, Footprint® WMS from Datex provided Endeavor Labs with two years of data to assist in the development of advanced machine learning (ML) models that would present live predictions to enhance labor efficiency and responsiveness. Detailed reports are now automatically emailed to subscribers on a regular basis.



Interested in seeing how Footprint® WMS's data accuracy can unlock new operational success in your warehouse?

[Preview Footprint® WMS here.](#)

ABOUT CSW

More than 75 Years of Cold Storage Excellence (and Counting)

With more than 75 years of experience serving food and beverage manufacturers and life sciences businesses, CSW is the premier provider of third-party refrigerated warehousing services in the Midwest and a top 15 cold storage warehouse provider in North America.

CSW has five warehouse locations throughout Wisconsin, each with frozen and refrigerated capabilities.

Primary service offerings include:

- Blast-freezing
- Tempering
- Technology-enabled services
- Industry certifications

With more than 100,000 pallet positions, CSW takes great pride in its ability to understand and adapt to the unique business needs of its customers, from small-scale producers to industry giants.

THE CHALLENGE

Optimizing Staffing, Scheduling, and Warehouse Performance

Facing the push to scale operations to support growing customer demand, CSW leadership recognized the need to take a more proactive and data-driven approach to manage the inherent volatility of warehouse operations and scheduling.

Labor alignment, a common challenge among warehouse operators, was a primary concern for CSW.

Difficulty aligning labor with variable throughput needs on an hourly, daily, and weekly basis required manual adjustments, leading to labor mismatches that impacted both overall productivity and service quality.

CSW identified several key needs:

- The ability to forecast labor availability and throughput on an hourly basis

"We pride ourselves on being flexible, reliable, and responsive to our customers... So especially when technology plays a role in our ability to deliver whatever services that that individual customer requires, we must be able to move fast and move collaboratively both on the outside and the IT side,"

HILL HAMRICK

Co-CEO of CSW

THE CHALLENGE

- The need to schedule loads to mitigate peaks while ensuring fulfillment of customer service commitments
- The ability to prioritize work to maximize labor resources across daily shifts

To address these problems, CSW needed the ability to predict labor requirements on a per-load basis to ensure hourly throughput expectations.

CSW used real-time data collection and analysis to optimize staffing, scheduling, and warehouse performance and leveraged predictive analytics to establish accurate and reliable labor standards.

CSW wanted to implement an ML-based predictive planning tool to automate labor forecasting down to the hour.

According to Hamrick, the goal was to use the accurate data already captured in Footprint WMS.

By partnering with Datex and Endeavor Labs, CSW aimed to apply ML to predict labor requirements and boost productivity across the board.

To solve this challenge, Hill Hamrick turned to Footprint WMS for unified warehouse data and Endeavor Labs for collaboration with its AI and ML tools.

THE SOLUTION

An AI-Enabled Joint Effort Rooted in High-Quality Data

CSW recognized that it already had access to a significant amount of valuable business data that could be used to develop a data-driven solution to its labor resourcing problem.

The first step was to collect this data from Footprint WMS and other software integrations.

CSW could then use this information to optimize labor allocation and drive operational efficiency based on real-time demand patterns, improving operational and cost efficiency.

“Using advanced analytics becomes pretty straightforward if your data is consistent and well-structured,” “Datex provided a great foundation for our work and helped us make an impact quickly.”

NATHAN GOULD

Founder and CEO of Endeavor Labs

THE SOLUTION

Footprint WMS provided a comprehensive, immutable audit trail, aggregating both real-time and historical data from which each employee's individual picking and loading time could be determined.

At the same time, Endeavor Labs developed an ML model and trained it on CSW data.

The project began with more than two years of data from Footprint WMS, specifically involving shipment details and time-stamped warehouse activities, such as picking and loading tasks, to define model inputs and outputs.

The ultimate goal was to predict shipment labor requirements based on attributes known ahead of time.

Because there is considerable variation involved in the way consumables are shipped and packaged, these variations and labor needs were incorporated in the data, and the ML model picked this up.

The individual account and the specific destination for the main shipment were the factors that required the most consideration for how much labor effort would be necessary.

This data was crucial in training the AI model, which looks at upcoming shipments to estimate the labor and materials needed to perform that particular work, then projects the number of labor hours required for loading.

After calculating the initial CSW expectations, a modeling technique known as gradient-boosted decision trees was applied.

This modeling technique combines the strength of decision trees (a model that splits data into branches based on specific features or attributes to make predictions) with the concept of boosting (building multiple models sequentially so that each new model tries to correct the errors of the previous model).

Using this technique clarified each feature's importance relative to other key metrics.

Footprint WMS then delivered the live predictions, initially through an hourly batch job.

Subsequently, a weekly retraining job was added to update the model with the latest WMS data.

THE SOLUTION

Reports are now automatically emailed to subscribers, including weekly accuracy metrics, allowing CSW to compare predicted labor for each appointment with actual labor used.

CSW also receives other detailed reports regularly, including recaps of shift activity, pallets turned per labor resource, and 24-hour outbound shipment burndown.

- The ultimate goal was to predict shipment labor requirements based on attributes known ahead of time.
- CSW partnered with Datex and Endeavor Labs to design and implement an AI-driven labor optimization strategy that boosts visibility and accuracy by leveraging predictive analytics to create consistent, detailed reports.

"In this effort, we have seen that, when warehouse operators leverage their creativity and ambition and collaborate with knowledgeable technology providers, challenges can be resolved and remarkable results can be produced. We look forward to more collaboration with these partners in the future."

BRYAN BATCHELDER

VP of Product at Datex

KEY TAKEAWAYS

- For more than 75 years, 3PL cold storage warehouse provider CSW has offered temperature-controlled storage environments, personalized service, and modern refrigeration technology.
- Rising customer demand required CSW to take a proactive, data-driven approach to labor, fulfillment, and resource allocation.
- Footprint WMS from Datex provided Endeavor Labs with two years of data to assist in the development of advanced machine learning models that would present live predictions for enhancing labor efficiency and responsiveness.
- Reports are now automatically emailed to subscribers and include the accuracy metrics from the previous week, enabling CSW to see the latest prediction for each appointment and the actual labor for each shipment.