

Artificial Intelligence (AI) enabled smart inventory management and control platform.

## Situation

Chicago Lighthouse Industries is a Chicago-based nonprofit social enterprise specializing in assembly, packaging, and distribution of high-quality brand name consumer products. Over 75% of its plant workforce are professionals who are legally blind. Its core products include clocks (best-selling item with the highest product variety), dated planners and calendars, ergonomic office products (such as monitor arms, and foot and back rests), and thermometers. The majority of its revenue (around 85%) comes from their partnership with the federal government through the U.S. AbilityOne Commission and National Industries for the Blind.

Chicago Lighthouse Industries faced a common challenge, but in its unique environment. The company utilizes a significant amount of varying raw materials and product types within each product category, but they lacked a systematic inventory control process. Complementary issues included existing old and obsolete machinery, lack of in-house inventory space, pricing management inconsistencies/challenges, lack of an inventory tracking/location system, inaccurate labeling, and lack of supplier and market tracking. Chicago Lighthouse Industries also sought a process to identify the ideal reorder points and quantities, instead of continuing to rely on their workforce's experience and intuition. A new inventory management system would reduce reorder cost, reduce time spent locating and reordering inventory, reduce lost opportunities, and more.

## Solution

In partnership with a faculty-led group from the University of Illinois Chicago, the team established an Artificial Intelligence (AI) enabled smart inventory management and control platform for prediction of demand, accurate order points, and quantities for different variants of raw material. The AI-enabled smart platform learns the patterns and behavior of market, suppliers, production, and demand through the use of historic data, and provides estimates on ideal ordering points and quantities towards cost minimization.

Our client was also experiencing high rates of retirements, so training and transfer of knowledge have been high on their priority list for the last couple of years. The company sought novel ways to train their employees and transfer knowledge, as the majority of their workforce is legally blind. This ranges from professionals with low vision issues to those who are completely blind. While not a priority for this project, future AI implementation was discussed with the plant manager. One solution explored is the adoption of in-process cameras for observing operators' hand gestures and providing sensory feedback when instructions are not followed correctly.

## Results

- Reliance on historic trends instead of employees' individual experiences
- Increased capability to forecast demand and market uncertainties
- Higher potential to minimize cost by identifying the ideal reorder points and order quantities
- More confidence in inventory management and control decisions
- Higher competitiveness and survival capability in the market
- Exploration of integrating AI into more Chicago Lighthouse Industries operations, including skills training

*"I am extremely appreciative of the effort and assistance that the collaboration between IMEC and UIC team brought to our Industries social enterprise. Over the years we had struggled finding effective outside assistance because of our diverse team and lack of effective systems. The UIC team did an amazing job of coming to our plant and observing our culture and processes to determine areas of improvement. Combining their observations with our historical data, they were able to create a unique AI platform that would specifically target some of our biggest challenges. This system will allow for greater organization and usage of data, enhance our ordering and inventory processes to lower costs, empower member of our team to be more productive, and create a platform that will be extremely useful for the next generation of Industries employees that will be joining us soon."*

*Phil Yatvin, Senior Director, Business Development - Chicago Lighthouse Industries*