



Client Story

Counting on Computer Vision to Empower Workers by Automating Inventory Management

As part of their mission to use Artificial Intelligence (AI) for good, a global manufacturer partnered with Insight to support the needs of their business and their employees with disabilities by developing a computer vision system to automate cycle counts.

A global provider of remanufactured printer parts, electronic asset lifecycle management and environmental solutions operates 60 locations in 18 countries around the world. Beyond supporting their customers with high quality products and services, the organization is driven by a passion for teamwork, community, and embracing and driving change.

As part of this mission, the company prides itself on developing applications that empower meaningful, independent work for adults with disabilities. Leaders are dedicated to leveraging this technology within their own operations, while inspiring other businesses to do the same.

Several years ago, they began looking for ways to better support the diverse needs of their workforce and promote a broader positive impact by applying "AI for good." The company partnered with Microsoft to develop a cognitive voice platform which could help their employees with disabilities more easily navigate and perform routine tasks in a manufacturing environment. The success of this project led other organizations to adopt the solution at their own facilities, creating new employment opportunities for the disabled community.

It also motivated the organization's CTO and his team to continue seeking out opportunities to use AI for good.

Industry:

Manufacturing

The challenge:

A global manufacturer needed a more effective way to empower workers of varying ability and experience levels to complete bi-monthly cycle counts of more than 38,000 pallets across the U.S.

The solution:

- Custom computer vision models to identify products
- Proprietary algorithm to model and count products
- Integration with ERP system for inventory validation
- A simple app, accessible to employees with disabilities

A new challenge

Like most manufacturers and distributors, the organization is required to perform product cycle counts every two months. But with more than 38,000 pallets (or bins) across the U.S., this is a costly labor- and time-intensive process which is prone to human error. In 2020, these challenges were exacerbated by COVID-19 as reductions in capacity increased demands on the existing workforce and made it difficult to keep up with routine counts.

The organization's leadership team wanted a way to apply AI to reduce the burdens of this manual task, recognizing an opportunity to build upon the existing processes and devices used by their warehouse staff. Their goal was to enable employees to easily capture a picture of a bin each time an item was restocked or picked for shipment. These images would then be uploaded and used to automate the cycle counting process.

They wanted the solution to be highly accurate and scalable, yet simple and accessible enough to be used by staff members with disabilities.

The client wanted a way to apply AI to reduce the burdens of manual cycle counts.

Building the model

In August of 2020, the organization reached out to its partners at Insight to help design a solution. Members of Insight's team began with a proof of concept, developing two computer vision models using Microsoft's Custom Vision Cognitive Services.

These models were trained to identify the products on a single pallet in a given image. But accurately identifying the correct products was only the first step. Using a front-facing image to count objects in a three-dimensional formation meant recognizing not only how many products were visible, but also inferring how many were not visible.

To solve this problem, Insight developed a proprietary algorithm to model a 3D virtual pallet of boxes based on the 2D image provided. By calculating the size of each product relative to the known pallet depth, the algorithm is able to accurately predict the number of products layered behind the visible rows. With the groundwork in place, Insight integrated these solutions into a simple application which could be operationalized within the existing environment.

Accuracy and accessibility at scale

Phase one of the project focused on pallets containing only one type of product, which simplified some aspects of the initial training process. But with the success of the pilot, Insight and the client rapidly shifted into phase two, extending the solution to pallets containing multiple types of products in multiple box sizes. With this additional training and optimization, the computer vision solution has now reached 93% accuracy.

The client's CTO expressed the significance of this solution and the value of Insight's partnership. "Our goal with these technologies is to give all our employees, with or without disabilities, the same opportunities to perform the same jobs in our warehouses — and to show other organizations this is possible." He said. "Together, [our company] and Insight have been able to move quicker, collaborate better and accomplish so much more than we would separately."

The app is now in use at eight warehouses across the U.S., eliminating the need for workers to perform manual cycle-counting and freeing up more time for meaningful, revenue-oriented tasks.

And the organization isn't stopping here.

Leaders are currently working with auditors to drive adoption of their cycle counting app industry wide. By licensing this and other proprietary solutions such as the cognitive voice platform to other manufacturers, they hope to enable other organizations to provide meaningful employment to adults with disabilities.

Looking forward, the organization continues to strive for new opportunities to support their own employees, optimize processes and lead the way toward broader change by using AI for good.



Benefits & outcomes:

93% accuracy achieved with model

Six months from pilot to **full production**



Implemented at **eight U.S. warehouses**

Plans to license solution to other businesses



More meaningful work for employees of all ability levels

©2022, Insight Direct USA, Inc. All rights reserved. All other trademarks are the property of their respective owners.
CCV-CS-1.0.06.22

solutions.insight.com | insight.com