AI-POWERED SPREADER CAMERAS FOR CONTAINER HANDLING EQUIPMENT

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"A low-budget way to automatically verify every container ID, on every lift, in every part of my operation?!"

In 2024, this has been the most common response I've received regarding TopView—Visy's Artificial Intelligence (AI) and Optical Character Recognition (OCR) solution for spreaders. into smart devices by implementing AI vision technology. The concept and benefits are obvious to all operators: by placing AI-powered cameras on the spreader, you will instantly verify the container ID on every lift therefore saving time and money on every move. It's not surprising that TopView has been our best-selling product of the year, and our order outlook is even stronger for 2025.

Terminals understand that a digitalised operation is easier to manage and scale than a non-digitalised operation. The main reasons for this are transparency, ease of sharing data, and the notion of a single source of truth. These IT-based process enhancements increase the profitability of every operation, and TopView contributes to all three.

TRANSPARENCY

By giving every spreader a set of 'eyes' in the form of AI-powered OCR cameras, there is an instant, digital record created pertaining to which box is moving on every lift. This record is automatically created anytime the spreader engages in a lift. STS loading and discharge operations on the quayside, RTG shuffling operations in the stacks, and Reach Stacker or Top Loader operations in the rail yard are all afforded the same level of digital transparency. Clerks no longer need to read container IDs and manually input them into a system. Container Handling Equipment (CHE) operators no longer need to 'assume' they're picking the right box. Foremen no longer need to tell team members that they hooked the wrong box. Visy TopView automatically identifies the container ID and updates the work order for which box is being moved by which spreader, and by proxy, the specific CHE.

Transparency also comes in the form of real-time photographs of the container being lifted. When the AI system takes pictures for the box ID, it also saves those pictures to a database for a customer-defined amount of time. In case of operational discrepancies or customer requests, those pictures can be searched to manually verify exactly which box was lifted and where it was placed. There is a series of pictures of the box that managers can use to authenticate the move history of the container. For example:

- The container was discharged by STS-2 and placed on TT-138 at 16:30 on 17.03.2024.
- The container was picked from TT-138 by RTG-4 at 16:42 on 17.03.2024.

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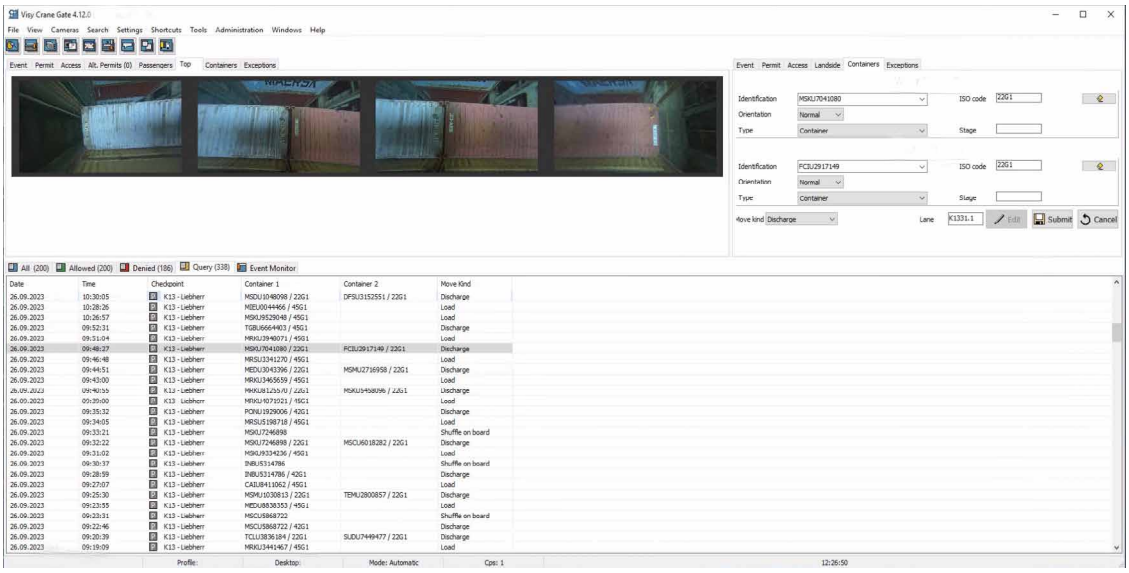


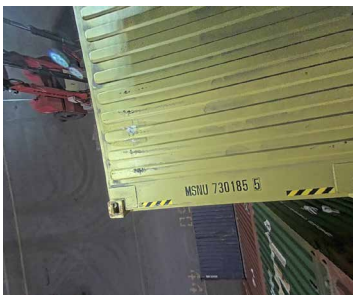
- The container was dropped in Stack 32, Column 10, Row 3, Tier 4, Slot 2 at 16:45 on 17.03.2024.
- The container was picked and moved to Stack 32, Column 9, Row 2, Tier 4, Slot 2 at 08:22 on 18.03.2024.
- The container was picked and moved to Road Truck with RFID tag number [NNN] at 13:16 on 18.03.2024.

At each handover of the container, there is a picture and digital record of exactly how the box moved through the operation. At no point did staff need to enter a box ID or manually confirm the box ID. TopView automatically reads the ID and updates the appropriate system.

EASE OF DATA SHARING

A key benefit of digitalised data is the ability to share it with third-party systems. TopView is an AI-powered camera system for data collection and sharing. In its basic use case, the data are the container ID, CHE ID, and a date and time stamp. When TopView captures the data, the sharing possibilities are specific to the operation. For example, the Terminal Operating System (TOS) will benefit from automatic and accurate data input during shuffling operations in an RTG stack. Often, there is a Position Detection System (PDS) that is already sending inventory data to the TOS. Therefore, on every RTG box move, TopView will send the container ID to the PDS and the PDS will update the TOS with the new location of the container. Again, at no point did an operator, clerk or foreman need to manually enter the container ID. In any case, TopView identifies the container ID and shares that data with a 3rd party system faster, safer, and more accurately than manual methods.

The benefits of data sharing are heightened when systems reference each other's results. What happens when the PDS and TopView 'disagree' over the ID of a box being moved? The user application will create an exception-handling event. While no operator wants to admit that stack inventory



"FOR A MEDIUM OR LARGE TERMINAL, MAINTAINING ACCURATE DATA IS NEARLY IMPOSSIBLE WITHOUT DIGITALISATION AND INTERFACES BETWEEN SYSTEMS."

can be incorrect, the reality is that most terminals face inventory challenges from time to time. Discrepancies occur and processes must be in place to manage those issues. With a PDS and TopView combination, an exception-handling alert will be automatically created when the systems disagree over the container ID. This means that inventory is managed in real time during every move. Furthermore, because TopView creates and shares a picture of the box, that picture can be manually verified by a clerk in the safety of a control room who simply updates the ID in the appropriate system. CHE operators do not need to stop the equipment from manually inputting a box ID, but rather the work is done on a remote desktop PC or tablet away from the stacks.

SINGLE SOURCE OF TRUTH

Together, transparency and data sharing provide operators with a single and reliable dataset by which to manage operations. For most operators, this means that clean data flows into the TOS and work orders are automatically distributed, executed, and confirmed in real time. Although exception-handling events will occur, they will be managed as they happen rather than after they cause a problem in the operation.

For a medium or large terminal, maintaining accurate data is nearly impossible without digitalisation and interfaces between systems. TopView as the eyes of the spreader provides a fast and safe way of automatic data collection and sharing that provides clear benefits. Now, when operators refer to the TOS, they can be sure that the yard map represents reality. When planners have accurate data, the team can execute work orders and produce strong operational key performance indicators (KPIs).

SUMMARY

In container terminal operations, efficiency can be limited by poor data collection processes, data silos (in the form of people or IT), or conflicting versions of events. Cost-efficient tools like TopView AI-powered spreader OCR allow operators to digitalise the data collection process, automatically share data (and update systems like the TOS in real time) and provide a straightforward way to verify the virtual world against the real world.

Together, digital transparency and the sharing of data provide operators with a single source of truth and improve operational KPIs. By turning traditional spreaders into smart devices, terminals will enhance processes, saving operators time and money on every move.

ABOUT THE AUTHOR:

John Lund has 19 years of experience helping marine and intermodal terminals achieve their operational objectives with digitalisation strategies. Having worked on scores of complex process automation projects, John supports operators in defining, designing, developing, and deploying systems that improve safety, efficiency, and profitability. Underpinning his career motivation is the understanding that the solutions he provides are instrumental in guiding the industry towards being a more dependable and resilient network for international trade.

John holds an MBA and a law degree. A Boston, USA native, he currently resides in Tampere, Finland. In his free time, he is active in film production and the sport of wife-carrying (a Finnish pastime).

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ABOUT THE COMPANY:

Visy Oy (Visy) provides process automation ecosystems to manage the flow of traffic, cargo and personnel in ports, terminals, and logistics centres. Every asset that goes in or out of a facility, whether by road, rail, or quay, can be managed by Visy technology. Visy's mission is to help its customers save time and money on each transaction, therefore improving operational KPIs.

With a history spanning three decades, Visy is a pioneer in OCR, applied AI, and deep learning for camera-based solutions in process automation. Visy ecosystems manage more than 6,000,000 automation tasks per day in over 30 countries to improve the quality of the supply chain.

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