



CUSTOMER SUCCESS STORY



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AI VISION CONQUERS HIGH-MIX
MANUFACTURING: **UNILEVER** RETHINKS
QUALITY CONTROL



See this case study on Yield, the
Elementary blog



Quality as a Service: Elementary's Vision Experts Power Unilever's Inspection Practices and Drive Operational Excellence

THE DIGITAL EYE OF THE CONSUMER: EMPOWERING UNILEVER'S GLOBAL QUALITY CONTROL

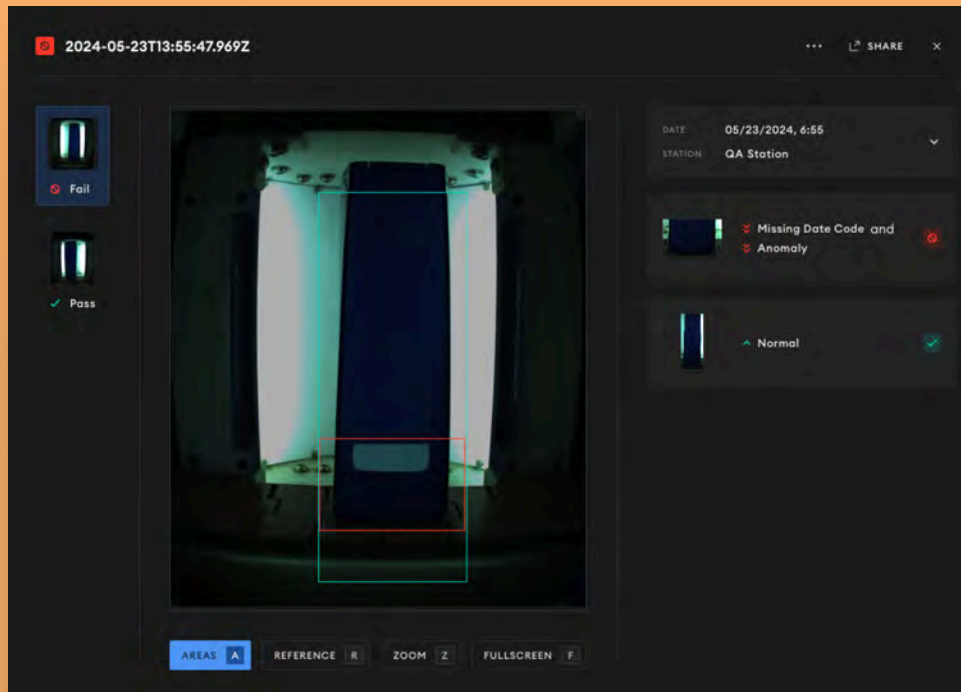


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Unilever is a multinational consumer goods company whose products are used daily in nearly every household around the globe. From bottled water and baby food, to soap and pharmaceuticals, Unilever's brands can be found on the store shelves in over 190 countries. But with dozens of SKUs across multiple product families and frequent label design changes, all sharing the same manufacturing line, Unilever's Quality Control team was struggling to find an

automated vision inspection system capable of reliably and accurately detecting defects across all products. Each SKU required a unique model, slowing down production and causing delays each time a new SKU was added. The traditional models weren't always able to recognize how defects – dents, scratches, label misprints, etc., presented themselves, prompting Unilever to start looking for a new approach to automated visual inspections.

Elementary's Quality as a Service solution engineers helped set up and train shared models, significantly reducing the number of models needed to accommodate the company's large SKU counts and shortening the time required to get new models online for product or label updates. Elementary's systems can inspect for multiple types of defects at scale, helping Unilever improve product quality and dramatically boost operational efficiency.

**CLIENT**

Unilever

INDUSTRY

CPG

INSPECTION STACK

Inspection Stations

Automated Cameras and
Sensors NetworkAI-Powered Image
Inspection Platform

Edge + Cloud

VISION TOOLS

OCR

Anomaly Detection

Large SKU counts, distinctive product shapes, and dynamic defect presentation create quality headaches for a manufacturer

Unilever's reputation and success is founded upon providing safe and high-quality products to their consumers. A big part of the manufacturer's commitment to quality is to ensure that every item that comes off their production line meets all applicable standards and regulations, which includes clear and legible labeling. However, with an ever-growing variety of products, packaging, containers, and label designs, Unilever's Quality Control teams found it challenging to find an adequate solution.

Traditional vision inspection systems were unable to detect all the defect types required, while other AI vision systems that Unilever has investigated required the team to train and maintain a unique model for each SKU, which needed modifications every time a change was introduced. And when the models were trained to recognize a specific type of defect, they frequently failed to identify it when a bottle was oriented in a way that positioned its label or lid away from the camera. As a result, products with incorrectly printed labels, underfilled bottles, and containers with missing caps were not being spotted reliably, prompting Unilever to start looking for a new generation of smart, easy to use, and data-driven visual inspection.

Elementary helps Unilever unlock the Digital Eye of the Consumer

The first step by the Elementary implementation team was to reduce the number of models needed to keep track of dozens of SKUs rolling down production lines at multiple Unilever plants. With 89 SKUs across five product families, requiring four inspections each, Elementary’s team reduced the number of models from 356 to 20, sharing models where possible to minimize maintenance overhead. Each model was trained to recognize multiple types of defects – regardless of how these defects were presented. Elementary’s vision systems are able to spot deviations from the standard even when cylindrical bottles are facing away from the cameras or when the date code is present, but doesn’t meet the print legibility requirements, making them more accurate and efficient than traditional quality control solutions.

The Elementary Quality as a Service approach ensured that Unilever received a full set of camera equipment, along with accurate setup and training for all models and ongoing support, training, and data reviews.



Models that learn as they inspect

Elementary's AI-powered models learn from examples. The more defects the inspection system comes across, the more adept it becomes in recognizing variations of these issues, even if it hasn't seen the exact issue before. This ability proved especially useful to Unilever when dealing with a variety of potential quality problems: spillage, dents, scratches, presence/absence of code, quality of print, and more. Models built from Unilever's other facilities serve as proprietary foundational models specifically adapted to the company's products and defect types, and can be used at new sites

out-of-the-box. Elementary's systems have no trouble keeping up with frequent packaging design changes and label updates, adapting to changes with minimal training, saving time and reducing maintenance expenses.

Solutions and data shared across sites, production lines

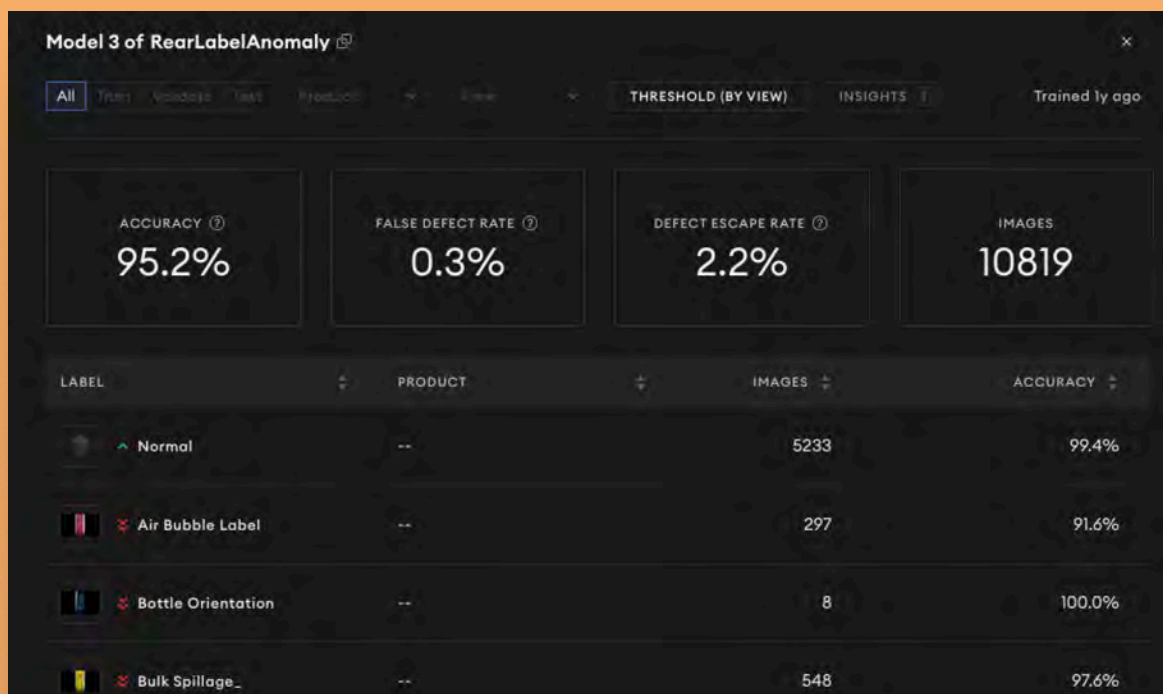
The shared tools approach didn't just help reduce the number of models and accelerate deployment – it also allowed Unilever to gather valuable insights into the production process across production lines and manufacturing sites globally. With data flowing in from multiple facilities, Unilever can identify trends, find common defect

trends, find common defect patterns, and drive ongoing operational improvements. Elementary refers to this approach as "closed-loop-quality" – where production data is used to perform root cause analysis to help prevent defects from occurring in the first place.

With powerful analytics capabilities right out of the box, Elementary helped Unilever create a proactive approach to product quality – something that they recognize as essential as they continue to scale their implementation of Elementary's Quality as a Service solutions.



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AI-driven quality platform

Elementary is an AI-driven vision inspection platform that enhances manufacturing quality control by automating defect detection and providing real-time analytics and insights. Specializing in scalable solutions, Elementary integrates seamlessly with existing production lines, offering a comprehensive suite of tools for quality assurance, traceability, and operational efficiency.



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