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Rethinking Packaging: How Automation Is Transforming Production Lines

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As manufacturing faces growing pressure from labour shortages, sustainability, and quality demands, packaging is becoming a critical point of focus, especially in high-volume sectors like wood processing. This article examines how one of the Baltic region's largest furniture producers restructured its packaging operations through automation, revealing broader shifts in how industrial systems are designed and staffed.

Martynas Česnaitis, Head of automation at VMG Technics, and Ingrida Grikpėdienė, CEO of VMG Wood Invest, a part of VMG Group, tells us more.

Across global manufacturing, packaging is emerging as one of the most urgent frontiers for automation. Once seen as the final step of production, it now demands alignment of speed, labour, material handling, and error reduction while addressing evolving operational challenges.

Industry data illustrates the cost of failure: unplanned downtime costs global manufacturing over $1.4 trillion per year. Packaging lines likely endure some of the highest unplanned downtime risks due to a high amount of repetitive manual labour. These risks are compounded by tightening sustainability requirements, rising safety standards, and an acute shortage of skilled labour. Eurofound estimates that over 41% of European manufacturers struggle to fill production and logistics roles.

Current trends and emerging technologies in packaging automation

In response to these challenges, manufacturers are turning to automation as a long-term solution. One of the most visible shifts is the move from plastic to recyclable, paper-based packaging, says Martynas Česnaitis, Head of automation at VMG Technics, a robotics company and part of the international

investment company VMG Group.

“This is motivated by tightening regulatory requirements and customer expectations. Packaging automation systems are being redesigned to accommodate these new materials, often more fragile or variable than plastic packaging.”

Another shift is the introduction of autonomous logistics. A rising number of mobile robotic systems, such as AMRs (Autonomous mobile robots) and AGVs (Automated guided vehicles), are taking over the responsibility of moving materials between production and packaging zones. This minimises manual material handling and increases safety and efficiency across departments.

Česnaitis stresses that AI is set to play a defining role also in the packaging sector. AI vision systems and predictive analytics are supporting manufacturers to detect defects in real time, anticipate maintenance needs, and optimise processes.

”We are moving quickly toward smart packaging lines that encompass AI vision systems, data analytics, and robotics into one self-monitoring process,” says Česnaitis. “This means we can identify issues in real time, perceive faults before they happen, and continuously improve processes with constant performance data.”

The expert emphasises that the future of packaging automation isn’t about replacing labour but building adaptable, scalable systems, and creating high added value jobs. AI, robotics, and predictive tools enable faster, smarter packaging while reducing downtime and waste. Consequently, it also transforms the workforce, with companies investing in retraining so workers can operate, maintain, and analyse data from advanced systems.

Overcoming production bottlenecks in wood manufacturing

These broader trends are especially relevant in industries like wood product manufacturing, where packaging presents unique challenges. Components vary significantly in size and shape, and production lines must sustain high output while ensuring each part is securely, safely, and consistently packed. Manual methods, long relied on for their flexibility, are increasingly difficult to scale, especially in the face of workforce constraints and quality control demands. As customer demands grow more diverse and product lines become more sophisticated, the need for consistent, high-output, low-error packaging is increasing.

One company that addressed these challenges proactively is Klaipėdos mediena, one of the largest furniture manufacturing companies in the Baltics, which recently overhauled its packaging operations. In response to recurring bottlenecks and labour constraints, it introduced machine vision for inspection, robotic forming and sealing systems, and automated cells for defect handling, all integrated without disrupting production lines.

Česnaitis explains that automation was not implemented as a shortcut but as a structural upgrade. “Packaging is often treated as the last step, but it became the focal point for us. In wood processing, the packaging stage must precisely handle large, variable components. Any failure here affects logistics, customer satisfaction, and ultimately competitiveness and profitability. Automation gave us the consistency we needed to meet demand reliably.”

Following the four-year overhaul, packaging productivity increased by 33%, going from 16.3 to 21.76 square meters per hour, and the speed of work increased from 9 to 12 parts per minute. Ninety-six manual positions were reallocated, and the remaining staff were retrained for supervisory roles. Robotic systems can now handle components up to 2400 mm, significantly improving workplace safety and reducing strain. Automated inspection has also stabilised quality by minimizing human error and variability.

”The biggest challenge was not the technology itself, but rather integrating technology into a live, high-volume production environment,” says Ingrida Grikpėdienė, CEO of VMG Wood Invest, a part of VMG Group. “Each solution had to be aligned with real production workflows, calibrated among many production lines. It was not just about installing machines, it was about optimising operations through innovative technological approach to secure long term sustainable business, ensure high added value jobs as well as ergonomic working environment.”