

INDUSTRY 4.0 NETWORK SITE VISITS

Bonson - A vision for a quality future



The profile

Bonson Industrial co. produce and source plastic, recyclable and fibre-based packaging for some of the most widely recognised Kiwi brands. From their modern facilities in New Lynn, Auckland, they manufacture injection moulded products predominantly used in the food industry. With a highly automated process they produce millions of units annually, all of which must achieve the high quality standards expected by their wide customer base and final consumers.

The background

Bonson have a wide range of in-mould labelled (IML) products where the label and plastic mould are combined at the same time to produce a high-quality finish with an embedded label made of the same material as the container, ensuring full recyclability. This technique automates the labelling process, but also means that every unit must be inspected for quality, especially when the differences between labels can be miniscule but ultimately determine whether the end product is packaged correctly. Historically where machines had a low number of cavities or longer cycle times and produced only one or two units per injection cycle, the manual process of inspecting and packing the products could be managed by one person across multiple machines. To increase capacity, higher cavity number machines have been introduced, making it more challenging for packing teams to keep up with the logistical elements of the role. Part of the packing team's job is to inspect the products for critical features visually as they pack. A new contract led to the introduction of their fastest ever machine, capable of 1 unit per second, which would have required 3 packers full time to quality inspect and pack the

product.

In addition to the visual checks, dimensional and specification checks around weight, lid fit and crushing performance are also carried out periodically and the data captured in the Manufacturing Execution system. The additional volume increased pressure and targets around productivity, which forced the Bonson team to look outside the box to improve their processes.

The solution

The team realised the benefits of capturing empirical data about machine performance, but understood it was unrealistic and expensive to carry this out more frequently using the packaging team due to capacity. They used the introduction of a new machine (trailing a new product alongside MG and Cryovac) to introduce new vision technologies to control labour costs. It was estimated based on throughput that the new machine would require 3 personnel full time to pack the product, an additional labour cost that would have significantly impacted margins on the new product line.

The team began an investigation into vision quality systems, settling after much enquiry on Omron, due to the fact that the support and spare parts were readily available from a New Zealand based supplier. The multi camera based system is able to be 'trained' by an operator to look for critical characteristics, which can then be saved as a programme to run for that product at any point in the future. The vision based system worked as part of the integrated solution to remove, transfer and stack the product and was able to

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inspect the product from any angle to ensure compliance to specification. The Bonson team sought the external support of ACSE as a provider of technical support to integrate the system with their machinery.

The result was that 100% of products could be inspected for all critical features, or a critical 'master feature' that determines whether the rest of the labelling was correct. The system also allowed them to start capturing validated reject data, whereas the manual system previously resulted in rejects with no known reason codes for the rejection. Additional features were also in scope to be validated by the camera system such as dimensions. This quantitative, validated and reliable data is going to provide a vital foundation on which Bonson can build their future Industry 4 journey by gathering real time insights on quality and detailed diagnostics on possible root causes for any failures. This reduces the reaction time and the potential scrap produced as well as education and understanding for the production teams.

The next step is to expand its use across clear plastic products through some adaptations based on learnings from their interaction with Omron, a brilliant example of where building a relationship with a solution provider could really add value to the business.

The database of information that will be at Bonson's disposal will allow them to overlay analytics on the data to gain insights on the quality performance of individual aspects of a machine and insights that can feed into their production scheduling process. Knowing which machines, machine setters and machine parameters provide the best empirical outcome for each product has huge potential to improve OEE.

Key learnings and benefits

- Vision systems are becoming more viable in terms of return on investment for ever increasing complexity of products.
- Turning tacit knowledge into empirical data can have potentially far-reaching impacts on other business processes. Here quality data might have a huge impact on product scheduling optimisation in the future.
- Vision systems offer the dramatic increase in data collection and digitisation; essential as a foundation for Industry 4 progression.

About the site visits & Industry 4.0

The purpose of the Demonstration Network is to drive uptake of Industry 4.0 technologies among New Zealand manufacturers with the aim of increasing their productivity and global competitiveness. The Network of Site Visits (NSV) are part of the [Industry 4.0 Demonstration Network](#), which also includes a mobile showcase and smart factory showing cutting-edge industry 4.0 technologies in action. The NSV takes selected companies through a fully-funded assessment process to help them accelerate their own journey towards Industry 4.0, and sees them share their knowledge with other manufacturers.

Further questions?

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