



BOSTOCK
New Zealand

Network Site Visit Case Study

Bostock New Zealand
Digitising the Continuous Improvement Cycle

INDUSTRY **4.0**
Network

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CallaghanInnovation
New Zealand's Innovation Agency

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Company Profile

Bostock New Zealand is a family owned vertically integrated horticultural company specialising in producing and marketing premium produce to high paying customers around the world.

Bostock grow and market high-quality organic apples and export conventional apples on behalf of independent orchardists. The company also grows organic and conventional squash, onions and maize as well as producing organic wine and organic apple cider vinegar.

They aim to be a truly sustainable company - environmentally, socially and financially - with the commitment of growing healthy, premium produce in partnership with nature, preserving and enhancing the environment for future generations.

Problem or Opportunity

With a growing squash operation, expanding its exports into additional markets, Bostock increasingly had stricter regulations to comply with in terms of the size / weight grading of squash. If incorrect, Bostock was either losing value from pricing differences per size grade; or in reverse customers would claim against the grower for not meeting specifications. All this was exacerbated by challenges in getting team members to operate the process, especially through the pandemic.

The traditional method for 'sizing' squash was a fully manual process, with product on conveyor belts and graders on either side making thousands of snap decisions daily to determine the size grade of a squash, typically Small, Medium or Large. This combined with manual handling of every squash to then ensure it went

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to the correct part of the process. Unsurprisingly, this job was an intensive task, which could wear out team members. Furthermore, depending on experience and skill the manual process could be as low as 30 per cent accurate to specification, resulting in significant customer claims.

With the ever-increasing volume through the packhouse, labour shortages and the increasing challenge of tighter customer specifications from emerging markets it was imperative that Bostock looked to alternative solutions to managing their size grading.

Key Objectives:

- Increase accuracy of size grading to consistently > 85 per cent (compared to between 30 and 70 per cent)
- Remove the requirement for 2 (of 4) people to operate in the Small/Medium Size grading area
- Fit the solution within the existing footprint of the sizing area

The Solution

Using an agile methodology to quickly prototype and iterate, the IT team at Bostock developed an in-line sizing tool, able to accurately determine weights and mechanically separate them accordingly.

Firstly, as is good practice, the team conducted extensive research through internet searches, liaising with suppliers of similar equipment and with their existing network to understand any existing 'off the shelf' or customisable solutions. It became apparent that nothing was readily available in the market, and they would have to develop the solution in house. Matt Stafford, Bostock's Innovation and Sustainability Manager

then applied for a project grant from Callaghan Innovation using the research as part of this application.

Once approved, the project grant allowed the Bostock team time to dedicate specific resource into building a prototype without distracting from existing business operations.

The prototype was retrofitted around the existing process to prove the concept they were looking to implement. Rigging the prototype to the solution, whilst still allowing for 'traditional' operation meant that testing could be done any time, and if unsuccessful, there would be limited impact to the product and customers.

The solution used readily available industrial components to determine an average size of the fruit, travelling at a known speed down a belt, based on known densities of the fruit and typical shape profiles. An algorithm then converts this into a known weight, liaising via a PLC with hydraulic rams, to separate fruit out as they pass down the belt. Originally incorporating a height measure for extra accuracy, it was later removed as the additional complexity did not sufficiently increase accuracy.

It is impressive and worth noting that Bostock extensively utilised internal resource such as interns from the local Eastern Institute of Technology to develop the solution. The advantages of this according to the project IT manager was to ensure that the functionality, ability to tweak and adapt the solution and repair or upgrade in the future remains in the business. Being a great innovative project to engage the team this also acted as a retention tool, exciting the teams that there would be interesting and challenging projects to work on in the future, where they could see the end result form from their own work. It is exciting to think that this innovative solution was put together

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using 'off the shelf' components showing the accessibility of technology integration.

The collaboration across the workforce was also great to see. In-house engineers and graders all involved in providing ideas as to how to improve performance. For example, a challenge with an earlier version was that the fruit were 'moving around' too much to get an accurate reading on size. Through multiple discussions, a solution was found to reduce this movement through some simple mechanical retrofits.

In the year prior to its installation, the business had experienced a few claims from the people-driven sizing process not being accurate enough, in the season just finished, with two fewer operators in this area, no claims were logged regarding sizing. A great example of where technology solutions aimed at achieving certain objectives can often have positive impacts unwittingly elsewhere. In addition, this project added sufficient weight to another process change elsewhere.

Although the main objectives focused on operational improvements, additional health and safety benefits have also been significant. Also of benefit is the ability to collect real-time data using the PLC that drives the process. The data generated helps provide improved business performance intelligence and improves growing and grading processes.

Key takeaways

- There are various funding opportunities available to companies looking to develop innovative in-house solutions, these grants allow teams to focus their attention on completing the solution and delivering results rather than 'fitting it around the day job'.
- Identifying already in-market solutions, that are comparable but not the same can be a great advantage when developing a solution, but also when applying for grants.
- Having a small, agile team with less 'red tape' allows projects to quickly adapt and deliver results.



About the site visits and 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?

To find out more please contact the
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