



Network Site Visit Case Study

ENI

Connecting up Enterprise
and Shop Floor Systems

INDUSTRY 4.0
Network

POWERED BY

CallaghanInnovation
New Zealand's Innovation Agency

PROGRAMME PARTNERS

 **Beca**



DELIVERY PARTNER

LMAC
CONSULTING

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About ENI

ENI are a leading provider of metalwork services in New Zealand. Their broad range of capabilities enable them to deliver a large variety of products and solutions. They support their customers from the initial design concept right through to logistics. ENI stands for excellence and innovation in the field of metal fabrication and is built on many years of industry experience.

Operating since 1993, ENI are a contract manufacturer with a strong reputation in New Zealand and Australia. The business prides itself on the high level of service, flexibility and quality that helps their customers to achieve their goals. ENI's capabilities are very broad and range from Design, CNC laser cutting, punching and folding, fabrication, powder coating and assembly.

Background

At the core of the operation is CNC profiling which is utilising advanced CNC laser and punch machines which cut shapes from steel sheets of various thicknesses. Smart and optimal usage of this machinery is one of the key drivers of success for the business which manifest in the following advantages:

1. Optimising the use of the raw material (steel sheets) therefore minimising wastage and the need to carry offcuts.
2. Reducing the time required to feed the machines with cutting programmes.
3. Optimising job sequencing to meet schedule and minimise setup times for the machines thus improving throughput and machine capacity and optimising flow through the factory.
4. Enhancing the accuracy of both labour and materials costing calculations for jobs.

For a number of years, the business had been using dedicated programming software for

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the machines and the engineering team had achieved good results in the four dimensions mentioned above. With the implementation of a new ERP system in 2020, the team at ENI was keen to leverage the increased wealth of data to make a significant leap in optimising efficiency in CNC profiling.

The solution

As part of the ERP implementation process, ENI developed an integration with the programming software. Work Orders and part information is sent from the ERP system to the programming software. In the past, the process of part creation in the programming software was manual and time consuming and led to having two independent and inconsistent data sets, which often led to confusion and reliance on the part knowledge of the machine operators.

The programming software tells the machines on the shopfloor what settings to use when cutting the profiles from the steel sheets. The other inherent feature of the software is called nesting: all kinds of parts from different customer jobs - as long as they are to be made from the same material - can be selected to be cut from the same sheet of material. Upon selection of the parts, the software optimises the layout of the parts on the sheets to minimise waste. At this point the programmers have the option to remove or add more parts to make full use of the materials. This happens in conjunction with a clear view of the ERP system's schedule to ensure good flow is achieved and customer orders are delivered on time.

Once the machine programming is complete, the information of the "nest" of jobs that were bundled together gets sent back to the ERP system specifying the exact quantity of materials to use and purchase, splitting the cost of the

materials and machine cutting accurately across the jobs in the nest. In the old disintegrated system environment, operators had to record their time against each job individually with little accuracy, materials could not be split accurately across jobs and admin staff needed to manually split the machine times across jobs - all of which is now at a very high level of automation.

Key benefits

- Reducing the amount of offcuts and waste created from the cutting process
- Reducing the amount of time that the Engineering team need to spend on setting up new parts in the programming software for the laser cutter
- Enabling products to be produced in sync with the ERP schedule, leading to increased efficiency, improved flow through the factory and reduced WIP
- Improved accuracy of labour and material costings and better quote accuracy
- Reduction in the amount of time and manual interventions required to move information between the ERP and programming systems.
- Increasing overall yield and material utilisation.

Key takeaways

- Connecting up digitalised systems to enable transfer of information between them can lead to multiple benefits across different KPI categories
- Keep an eye on what information is contained in different systems. Combining what you have can lead to unexpected opportunities and benefits, providing insights into your processes that you didn't expect
- Always think about where information and

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data generated by the planning process is to be stored and how easy it is to access via other systems

- When deploying technology to the shop floor, always think about how Industry 4.0 can simplify the process. This can lead to opportunities to improve training outcomes and increase workforce flexibility
- Don't forget to provide digital training to your teams on the shop floor as you embark on your Industry 4.0 journey.

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 EMA or Frank Phillips at LMAC

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