# Case Study
## Harpscreen GB

Delivery Partner

VEC

### Background

Harpscreen GB manufactures wire mesh products to order for industrial applications, including quarry screens and woven wire quarry screens. Each individual mesh order requires a custom-built metal jig for holding the individual wires in place during the welding process. These jigs must be precisely designed according to the mesh specification before they can be manufactured and used on the production floor.

### Challenge

Designing the metal jigs used in Harpscreen's wire mesh production is a complex process governed by multiple design rules. Historically, these rules have been applied manually by a single experienced member of staff, who interprets mesh specifications required and determines exactly how the jig should be constructed.

While this approach is effective, it poses two major challenges for the business. Firstly, the majority of the knowledge required to design these jigs sits with a single individual, creating a potential risk as that employee approaches retirement. Secondly, the manual design process slows down production, as each new mesh order must be translated into a jig layout before manufacturing can begin.

### Solution

Through the UKSPF Horizons project, Harpscreen GB initially engaged with the digital experts at the VEC to discuss their existing manufacturing processes and explore opportunities for implementing new and emerging technologies for streamlining workflows.

Kickstarting the project, Harpscreen GB trialled Fusion360 CAD alongside an Excel-based solution to begin automating the jig design. Working closely with the VEC, the Harpscreen GB engineers and designers realised the possibilities for performing 3D modelling to enhance digital product design and collaborative engineering.

This integration demonstrated clear potential for Harpscreen GB, leading to the company being awarded a grant. This enabled Harpscreen GB to invest in a CNC cutting saw, further automating elements of the production line. However, the design process that feeds instructions into the CNC machinery remained manual, meaning the full benefits were not yet being realised.

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### Solution

Haprscreen GB aimed to investigate how mesh specifications could be directly converted into jig layouts and CNC machine instructions. This approach would eliminate a significant bottleneck, preserve valuable internal knowledge, and unlock the new equipment to its fullest capacity.

The VEC digital experts developed a more refined and practical bespoke solution based on Harpscreen's processes and newly purchased CNC equipment. This support included a detailed analysis of the jig design rules for translating manual decision-making into structured, digital logic. This informed the development of a web-based application that:

- Accepts a magnitude of mesh order specifications
- Automatically generates 3D models of the required jig
- Produces instructions aligned with the CNC saw for seamless implementation

The system effectively connects order inputs with manufacturing outputs, enabling a more seamless and automated workflow. A supporting data structure was also introduced by the VEC team to better connect order information with shop floor activity.

### Impact

The partnership between Harpscreen GB and the VEC demonstrated how digital technologies can modernise manufacturing, improving efficiency and reliability.

By optimising workflows and minimising dependence on manual processes, Harpscreen GB successfully tackled a major production bottleneck. The incorporation of CNC cutting processes led to enhanced efficiency and consistency. Furthermore, the development of a proof-of-concept data management system enhanced the alignment between order specifications and the responsiveness of production tasks.

This partnership enabled Harpscreen to safeguard its expertise, embrace automation, and uphold precision while minimising risks. This initiative highlights the potential of digital adoption to transform traditional manufacturing practices and enhance long-term business resilience.