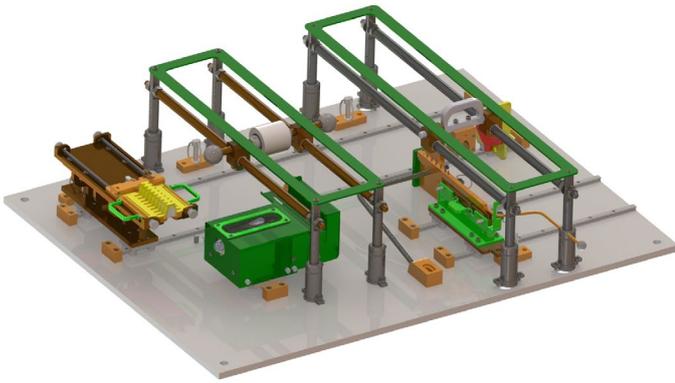
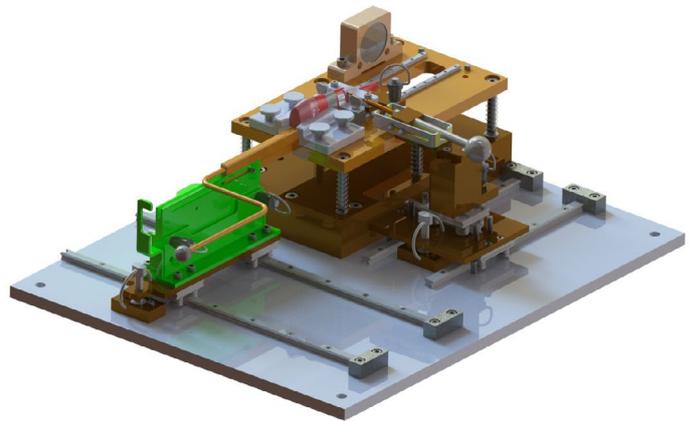


DEVELOPING AN AUTOMATED PROCESS FOR WARM WATER PRAWN PRODUCTION

Funded by the 'UK Seafood Innovation Fund [SIF]', a collaboration between the MTC and C-Tech Automation has proven the viability and opportunity to deliver automation into the \$25bn dollar warm water prawn industry.



“De-shelling Rig”



“De-veining Rig”

“ The process of de-shelling and de-veining warm water prawns is manually dextrous and heavily reliant on skilled workers. Yearly the labour pool reduces and the costs increase as workers opt for higher paid jobs outside of the food sector.

Thanapol Khetking, Senior Research Engineer

THE CHALLENGE

The automation of a manually dextrous operation, especially when using an organic product, is always a complex one; robotics, end-effectors and vision systems do not have the dexterity of humans so this highly precise automation goal is always a challenge. The current process to remove the shell and ‘vein’ from the prawns is exclusively a manual one, yet is currently achieved using basic hand tools. Automation aims to increase the productivity of the manufacturing process, reduce operating costs and reliance on a freely available large pool of low-cost labour. Automation is not designed to replace the skilled workers but to aid them. The particular innovation from this project was to develop a prototype machine to replicate the de-shelling and de-veining process.

MTC’S SOLUTION

- ▶ Requirements Capture & Concepting - MTC developed multiple concepts and conducted initial trials in order to down-select the best process methodologies, and determine optimal parameters for the design of the prototype machine
- ▶ Detailed Design - The detailed design was carried out at MTC with support by C-Tech Automation for manufacture and build of the de-shelling and de-veining test rigs
- ▶ Validation - MTC commissioned the manual trial rigs and conducted a comprehensive series of tests to prove performance, develop design improvements, analysis of results, and reported and provided recommendations for future development of the system to the consortium

THE OUTCOME

- ▶ Design and build of two proof-of-concept; de-shelling and de-veining rigs
- ▶ Commissioned the rig to set the best parameters suitable for trials of specific grade of prawn
- ▶ Great success on the de-veining process which has been proven as a viable concept to full automation
- ▶ Partial success with suggestions for future development on the de-shelling process
- ▶ Detailed report which summarised the results and analysis of the trials with a full list of recommendations for future projects

BENEFITS TO THE CLIENT

- ▶ Proven methodology that automation can be adaptable when working with manually dextrous processes
- ▶ Successful assembly of test prototypes, namely 'De-shelling Rig' and 'De-veining Rig'. Each of the rigs have retained the option of integrating the two systems into one large station for both individual and combined trials
- ▶ Reduction in subsequent design time through implementation of physics model for rapid analysis of proposed design changes
- ▶ The feasibility of up-scaling with current readily available technology for aiding semi-automated to fully-automated systems in the future



Starting this journey by concepting with hand tool trials and developing two full manual trial rigs, utilising the research and innovations from the consortium to produce successful results is a large step forward for the industry. Our results have de-risked the next steps needed to automate the process.

Matt Rayment - Chief Engineer, C-Tech Automation



↑ 60%

Manual Rig Success Rate
of De-Shelling Rig

↑ 86%

Manual Rig Success Rate
of De-Veining Rig

77+

100+ Prawns Tested / 77 Officially
Trialed and Recorded



De-shelling Rig and Results



De-veining Rig and Results