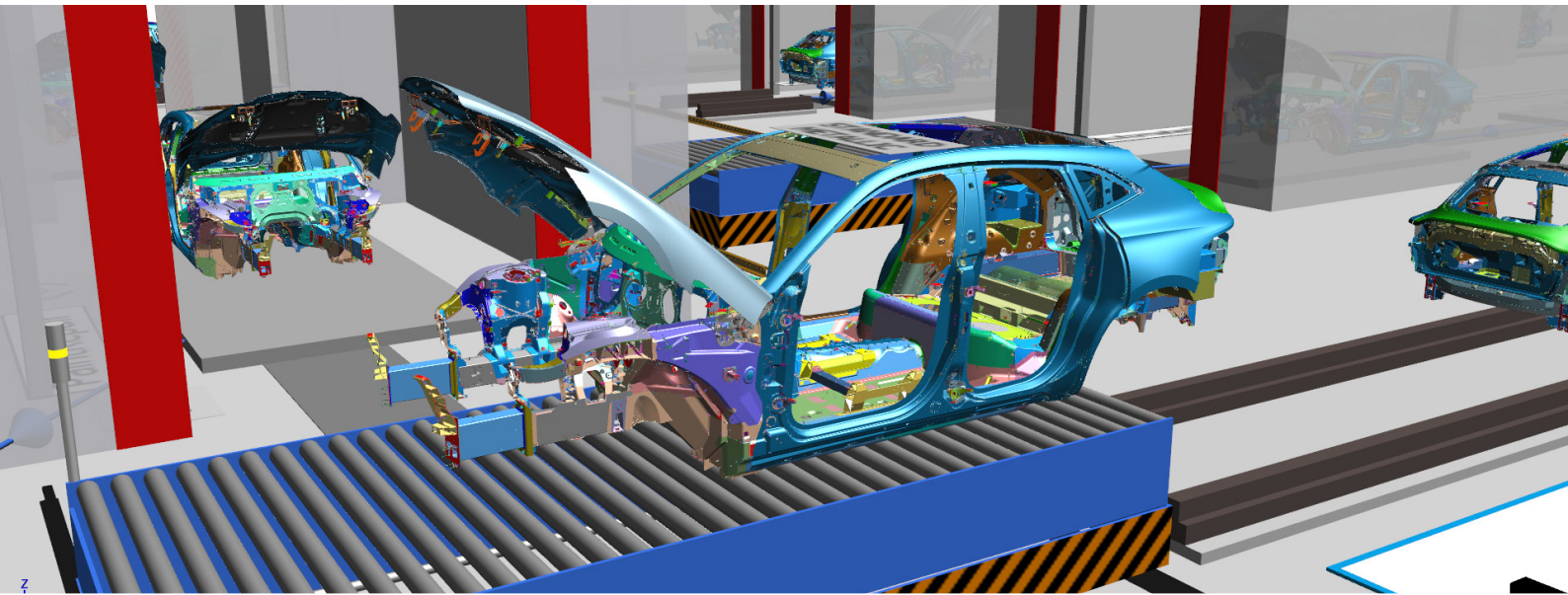
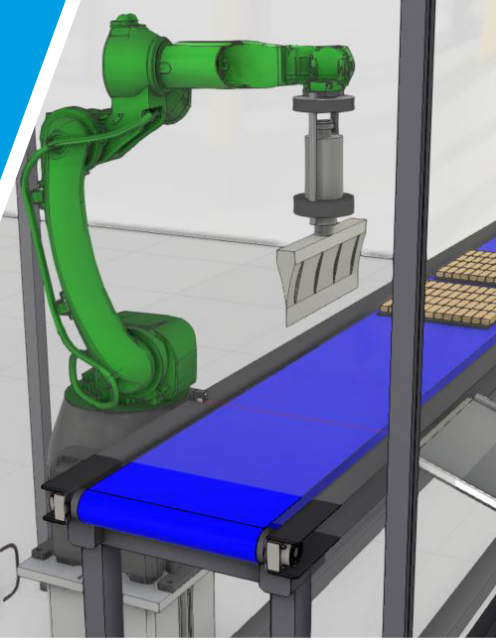




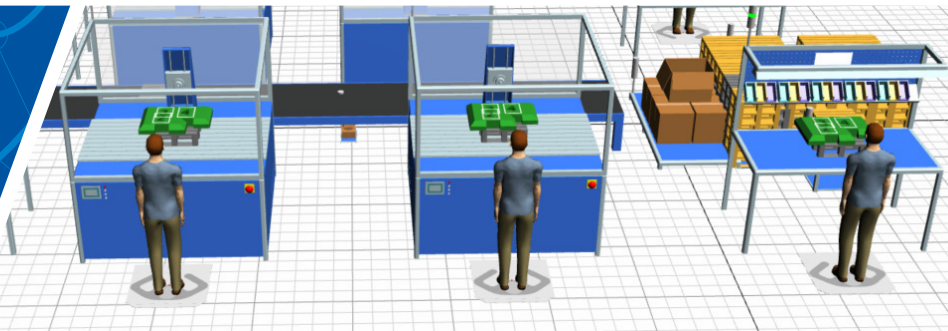
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Discrete Event Simulation



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AMRC Cymru is a cutting-edge R&D facility, providing an open innovation platform accessible to all manufacturers. Our team de-risk R&D investment to drive step-change improvements in productivity, quality and sustainability.

Part of the University of Sheffield Advanced Manufacturing Research Centre's (AMRC) network of world-leading research and innovation centres, and backed by Welsh Government, AMRC Cymru is the first High Value Manufacturing (HVM) Catapult centre in Wales.



In response to the opportunities and challenges posed by rapid advances in digital innovation, the Welsh Government has developed an ambitious vision for Wales that includes targeted business support to allow manufacturers to introduce innovative technologies and improve productivity.

Discrete Event Simulation (DES) is one of the digital tools that will be key to the rapid recovery of the Welsh economy and its future resilience. Through DES, manufacturing facilities or business processes can be modelled to: evaluate system performance, optimise resources, perform what-if scenario testing, and run alongside physical systems to achieve predictive analyses.

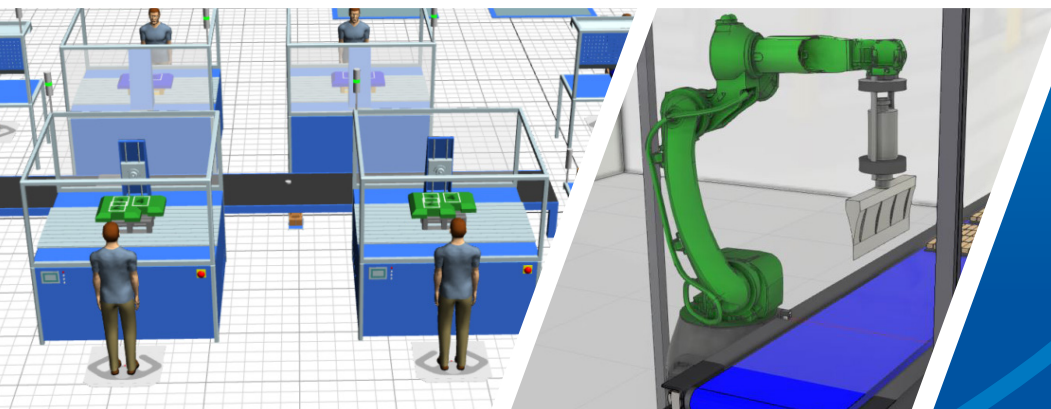
The following case studies demonstrate the impressive impact of utilising DES tools and similar technologies.

SIEMENS

Plant Simulation



Llywodraeth Cymru
Welsh Government

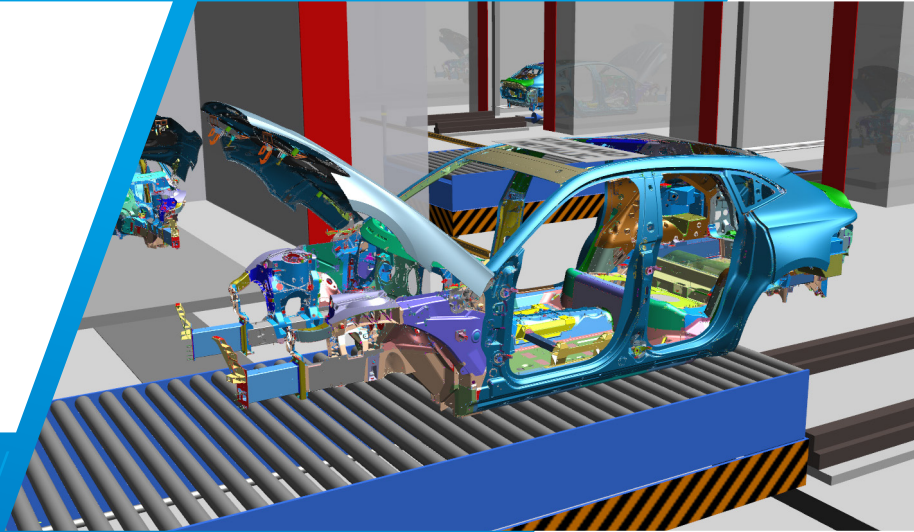




Aston Martin

Sector: Automotive

Aston Martin is a British independent manufacturer of luxury sports cars and grand tourers, and one of the most well-known automotive brands in the world.



The challenge:

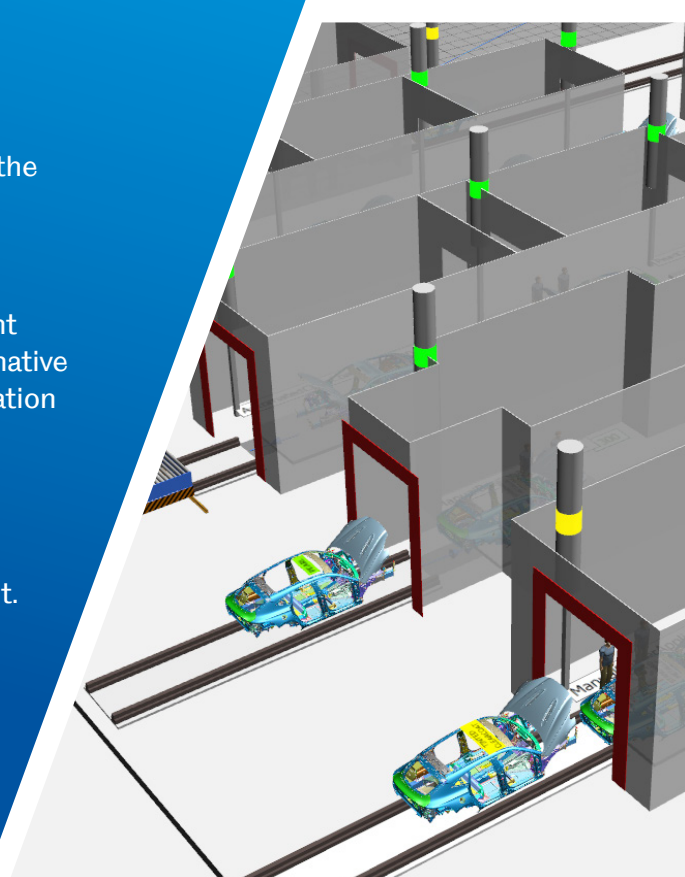
To analyse the effects of implementing new shift patterns within the paint shop at the St Athan factory and simulate the integration of a new vehicle model.

What we did:

Created a digital representation of the entire St Athan paint shop production line, then analysed the impact of an alternative shift pattern on the polishing line and modelled the integration of an alternative vehicle into the paint shop process.

The result:

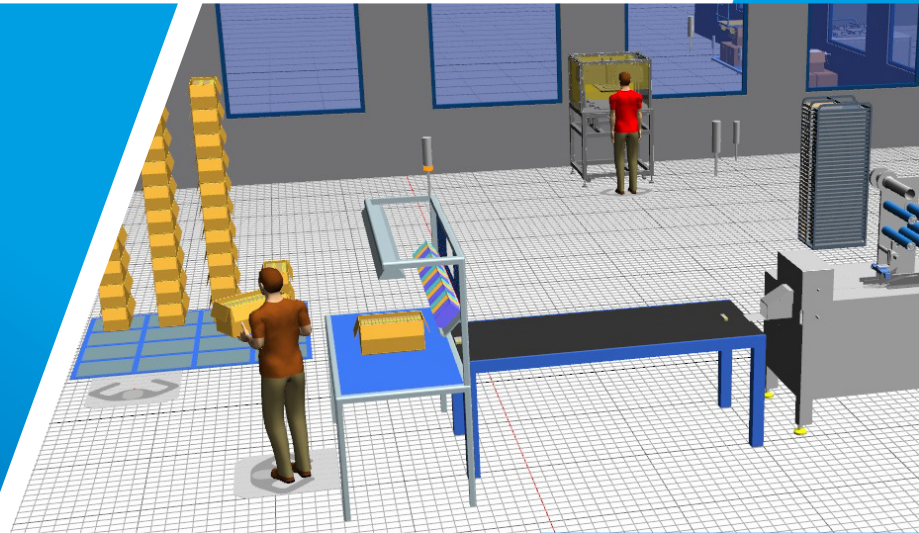
Identified that changing the shift pattern on the polishing line would increase lead times and reduce daily throughput. A new vehicle model was introduced to the paint shop process flow, with various shift patterns on different lines evaluated, and a combination of two and three shifts was selected to reach desired throughput.



The Pudding Compartment

Sector: Food and Drink

The Pudding Compartment specialises in the creation of premium puddings and desserts, sold to a growing number of pubs, cafes, restaurants, delis and farm shops.



The challenge:

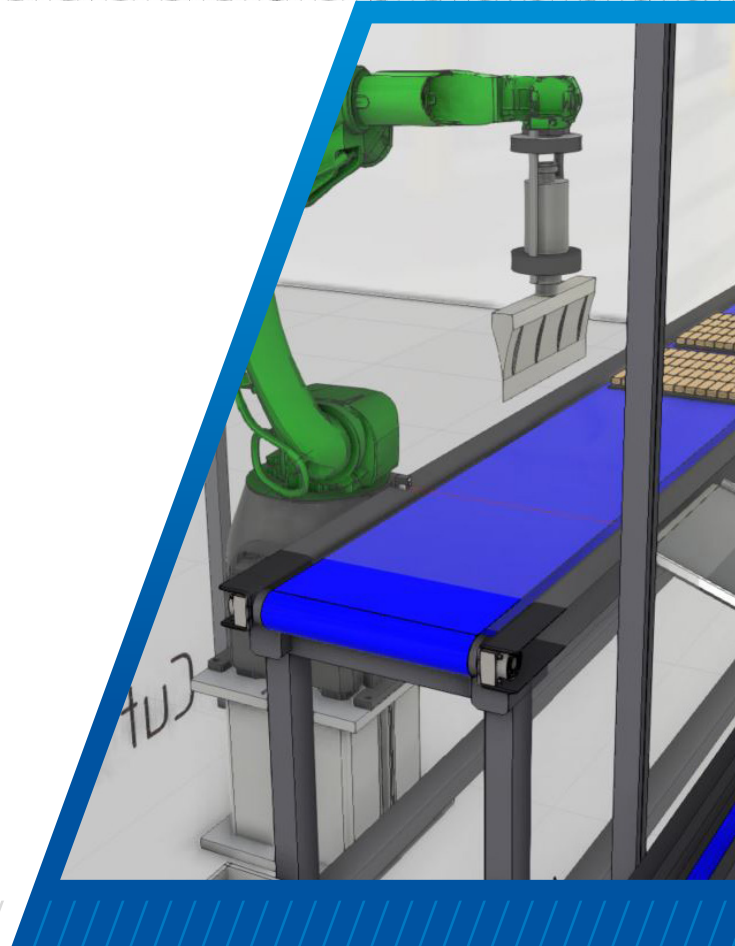
To look into increasing throughput production of The Pudding Compartment's bakery to keep up with increasing customer demand.

What we did:

Created a digital representation to measure workflow through production and packaging operations, identifying bottlenecks and choke points within the process.

The result:

Identified automation opportunities throughout the packaging process. A continuation of this project to create concepts to implement automation, funded by Welsh Government, has been driven by this DES study.





Nidec Control Techniques

Sector: Electronics Manufacturing

Nidec Control Techniques design and manufacture electric motor control technology for industry. Its portfolio includes AC, DC and servo variable speed drives as well as power conversion technologies.



The challenge:

To see if a new production line that manufactures drives, brought into the facility from another site, had the capacity to meet desired volumes.

What we did:

Created a digital representation of the current process to give a baseline simulation of the manufacturing operation and then looked to reduce the cycle time of one of the bottleneck processes.

The result:

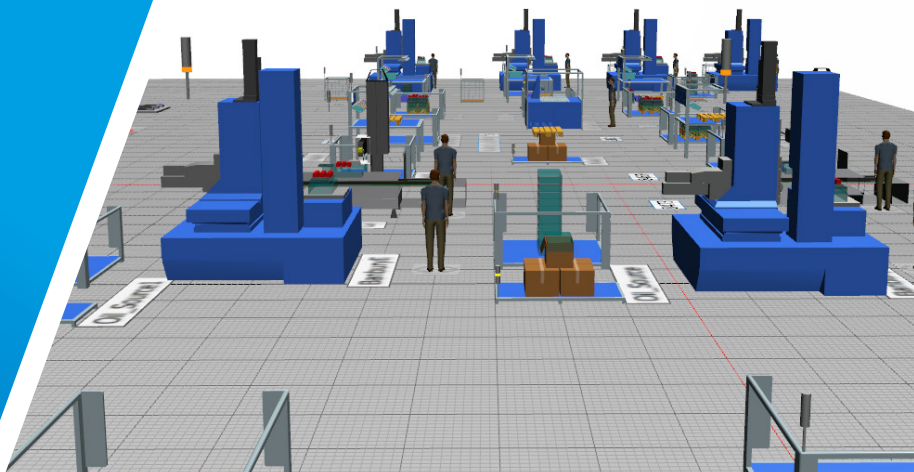
The baseline model highlighted bottlenecks within the production line. The simulation then demonstrated that a possible solution to one of these bottlenecks would require work further upstream of the process to have measurable benefit.



Clwyd Compounders

Sector: Automotive and aerospace

Clwyd Compounders is a family business based in Wrexham. They offer industry-leading technical support and supply compounds to many safety-critical applications in a variety of markets.



The challenge:

To model Clwyd Compounders' production process to view the throughput through the facility.

What we did:

The process flow and production data were used to create a baseline model of the facility which helped identify equipment utilisation and recognise bottlenecks in the process. Various scenarios were developed to evaluate the effects of prospective process changes and investments in equipment on the facility's throughput.

The result:

Clwyd Compounders was provided with data-driven information about the bottlenecks within the facility. It plans to present this information to stakeholders and use it to make future investment decisions for improving the performance of the factory.





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If you want to understand how Discrete Event Simulation could help you overcome your manufacturing challenges, contact:

Andy Silcox, Research Director

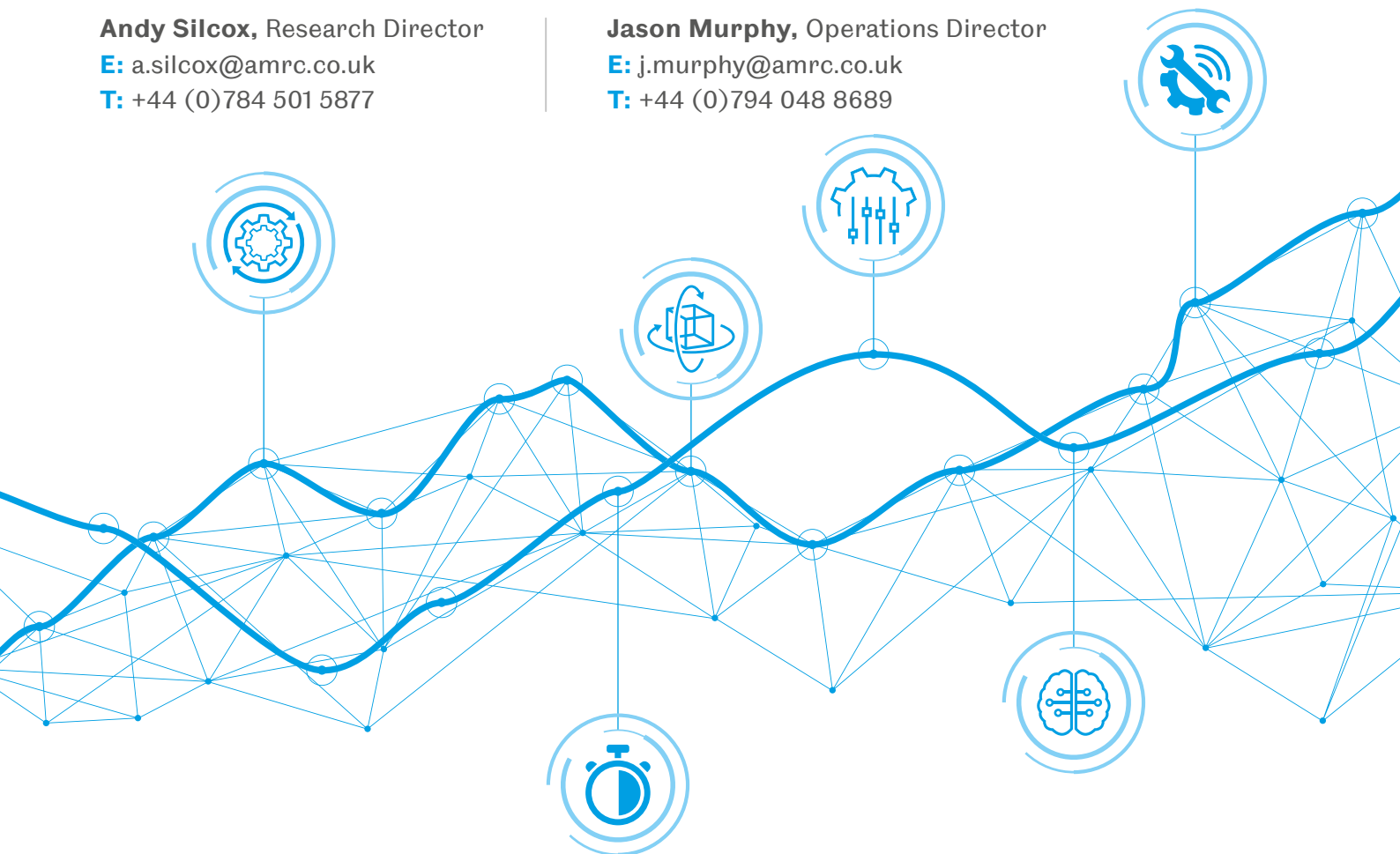
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