Centre for Future Materials
Customer Success Story

University of Southern Queensland

The University of Southern Queensland (UniSQ) is leading the way towards building innovative solutions for Australia within the Centre for Future Materials (CFM). CFM is pioneering research and development in advanced composite manufacturing for civil, mining and aerospace sectors to name a few.

Challenge

Due to composites having multiple layers of materials oriented in different directions, being able to implement a repair that is unique and most suitable for that location can be challenging.

CFM quickly recognised the need to adopt a virtual twin solution to streamline its processes. Whilst existing tools for digital twin could be used, many don't feature a continuous thread of data flowing from the initial inspection through to the design and manufacturing of that repair patch, and then back into service.

Benefits Achieved

- Streamlined workflow from design through to manufacturing
- Digital thread of all discrete capabilities
- Advantage in modelling and predicting the performance of parts
- Sharing repository for multi-institutional collaboration

Solution

Inspired by similar uptakes by industry leaders, CFM, MEMKO and Dassault Systèmes recognised the need to adopt virtual twin software to create a new automated and streamlined repair process solution of composite structures for aerospace.

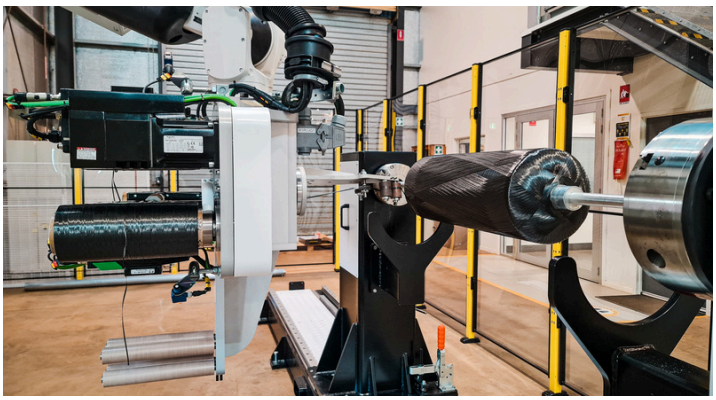
The Dassault Systèmes suite provides a tool to create not only Digital Twins for all stages of the aircraft components lifecycle, but the potential to create a digital thread of data from design all the way through to MRO.

Implementation & Successes

The solution, the first of its kind for the end-user, is currently being utilised within the Digital Twin of Composites Manufacturing & Repair Processes project under the UniSQ led iLAuNCH Trailblazer program. “The ability for the solution to be versatile and applicable to a variety of designs will be tested on two aerospace components, including both monolithic and honeycomb stiffened structures,” said Dr Shelley. “The outcomes of these development activities could be applied to all composite structures on an aircraft, including repairs to structures where the underlying stiffening element, such as a spar or stiffener, also resides.”

The Dassault Systèmes suite has been implemented for the first time across all stages of the product lifecycle, from design through to manufacture, service, maintenance, and repair. As a result, the CFM can deliver a digital thread of all discrete capabilities within the software suite, giving the end-user a competitive edge in streamlining their workflow. “We’re linking all the process lifecycle steps to provide a complete solution, significantly benefiting industry. CATIA especially has very strong capabilities over other CAD/CAM systems for composite materials. It gives us, as researchers, advantages when it comes to modelling and predicting the performance of those parts. Overall, the tools are very intuitive, and we also appreciate that the sharing repository is well set up for multi-institutional collaboration.”

“For CFM and our relationship with MEMKO and Dassault Systèmes, it is just the start of what we will do together. We’re already discussing future endeavours and we look forward to continuing to work towards providing relevant and fit for purpose solutions to our industry partners.”



> “This collaboration allowed the team to produce a fit for purpose solution for industry. From an academic perspective, it gives us the tools we need to produce high-quality and high-impact publications. With the Dassault Systèmes software, we can now offer a complete solution in digitising Aerospace Composite Repair Processes, which would be much more difficult with the current available systems.”
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> *Tristan Shelley, Senior Research Fellow at the University of Southern Queensland*

To see how the 3DEXPERIENCE CATIA or SIMULIA solutions can be implemented in your business. please get in touch to speak to a product expert or book a demo session

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About MEMKO Systems

MEMKO Systems is an Australian-based company with multidisciplinary engineering capabilities supported by highly experienced and skilled staff with an extensive track record working with global OEMs, Defence Primes, and Government Agencies. MEMKO Systems delivers advanced manufacturing solutions, digital transformation technologies and industry upskilling training. Quality management system is ISO9001 and ISO27001:2013

Capability Areas

Analysis, Modelling & Simulation	✓
Digital Twin & MBSE as a Service	✓
Design & Engineering	✓
Infrastructure as a Service	✓
Deployment, Support and Upgrade Services	✓
Training Courses	✓