

DIGIPROP: A COLLABORATION BETWEEN DOWTY PROPELLERS, GE AVIATION, MTC, AMRC AND NCC



INDUSTRY 4.0 TECHNOLOGIES FOR COMPOSITE AEROSPACE PROPELLER MANUFACTURING

The DigiProp consortium, led by Dowty Propellers [GE Aviation], is a collaborative research project that has developed technologies within a new digital infrastructure, delivering benefits in propulsion performance and cost efficiency. Through work package 4 of DigiProp, Dowty and the MTC have developed and demonstrated new smart factory concepts for more efficient production of propellers systems.



The MTC have given a real boost to our intellectual capabilities, helping us to understand how to get the best out of our factory, highlighting the tools that are available to us and identifying suitable technology partners.

Simon Peckham, Manufacturing and Training Leader, Dowty Propellers



THE CHALLENGE

- ▶ Develop and validate new factory concepts for more efficient production of composite blades and propellers utilising digital manufacturing technologies
- ▶ Realise improvements in operational metrics such as Overall Equipment Effectiveness and production lead time
- ▶ Assess hardware, software and systems architectures that can support the production of the next generation of Dowty Propellers products

A COLLABORATIVE APPROACH

- ▶ Cross-functional MTC team making use of a wide range of technology and industry knowledge
- ▶ A collaborative approach, integrating with other work packages and project partners
- ▶ Prioritised ranking of digital technologies based on Dowty requirements
- ▶ Collaboration with a wide range of technology providers to select and configure the most appropriate solutions and plan adoption

THE OUTCOME

- ▶ Creation of the 'DigiProp Demonstration Cell'; a testbed environment to prove out technologies for data capture, processing, transfer, aggregation, storage, analysis and visualisation
- ▶ Development of Discrete Event Simulation Digital Twin of Dowty propeller value stream to generate intelligent production schedules
- ▶ Demonstration and adoption planning of technologies including: assisted manual assembly operations, real-time location tracking for parts and assets, machine vision quality assessment, Model-Based Definition workflows, Innovative Non Destructive Testing approaches
- ▶ Development of a toolset to manage the journey from objective setting, through technology selection and development to implementation

BENEFITS TO THE CLIENT

- ▶ Reduced risk of implementation for new technologies via proven tools, suppliers, workflows and integration approaches
- ▶ Skills and roles identified for future production methods
- ▶ New capabilities developed, e.g. smart scheduling, composite blade inspection
- ▶ Testing of competing options for hardware/ software/ architectures in a production relevant environment
- ▶ Gathering user feedback to improve system designs
- ▶ Finding and mitigating integration and cyber security issues in a safe environment, without affecting production
- ▶ ROI estimates before purchasing full scale HW/SW



The DigiProp project has allowed us to consider what the Digital Thread looks like for propeller systems, from initial customer requirements, through design and manufacture and into service.

Jonathan Chestney, Engineering Leader, Dowty Propellers



PARTNERS



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