Exploring the value proposition of digital engineering through industrial test beds

CHALLENGE

The need to embrace digital transformation to remain competitive and profitable is essential for growing businesses. The challenge is how to harness digital technologies to fuel innovation, agility and stimulate growth.

New business models, customers and markets offer growth and revenue opportunities. From IT to product development, design and manufacturing, digital technologies are the foundation to capitalising on the possibilities for the future.

Digital technologies will transform the way organisations and engineers operate to meet new product and market demands. Determining the best digital tools and technologies to invest in, through to exploiting value from the vast quantities of data generated through the product lifecycle, a greater exploration is needed by organisations.

RESULTS AND THE DIGITAL OPPORTUNITY

DETI has demonstrated digital engineering practice and concepts and developed a range of state-of-the-art physical and virtual industrial test beds. Open, secure access to these and DETI Partner test beds and industry relevant data and problem statements is available to organisations across the UK.

Targeted towards manufacturers, technology organisations and SME's, DETI test beds allow organisations to launch quick-fire digital projects to solve industry relevant use cases and learn about digital transformation, in a secure, industry-like physical environment, enabled and supported by DETI experts.

Organisations focused on product, process and technology development, can explore technologies to determine efficiencies, reduced risk, increased innovation opportunities, lower product development costs, and accelerated time to market.

Industrial test beds offer:

- Manufacturing and machine-led organisations the opportunity to explore the value proposition of digital transformation and technology without impacting production lines and business operations. They can be used to de-risk implementation, demonstrate ROI and increase business agility
- Digital technology providers the ability to access a platform to showcase, trial and develop their products and virtual services. Organisations can provide technology and hardware which can be integrated into the test bed and tested through industry use cases

Virtual access to DETI test beds allows for active engagement from a wider audience within an organisation and de-risks business adoption by improving cultural uptake, offering mechanisms for offsite training.

DETI has also produced a range of digital prototypes and proof-of-concepts already embedded in test beds that use Artificial Intelligence, Machine Learning, digital twin, and visualisation technologies, so companies are not starting from scratch.

Industrial test beds available through DETI and its partners include:

- **High Value Digital Design & Engineering (CFMS):** A recognised and trusted digital test bed for digital design and the exploration of high value engineering products and processes to improve industrial productivity
- **Smart Factory Operations (NCC):** A full scale industry relevant facility to evaluate digitally enabled operations use cases: Operations control centre, energy monitoring, predictive maintenance, asset and resource tracking and flow optimisation
- **I4.0 Manufacturing of Composites (NCC):** A series of full-scale physical composite manufacturing cells to evaluate use cases: sensors and data acquisitions, dashboarding and augmented applications and self-adaptive manufacturing process
- **Augmented Manual Operations (NCC):** Access to virtual reality and augmented reality systems to evaluate use cases: Immersive training scenarios, guided and verified hand lay-up of composites, digital work instructions
- **In Factory IoT (NCC):** Access to networking, IT and IoT infrastructure to evaluate architectures and deployment of IoT, 4G and 5G, cybersecurity and quantum key distribution solutions (hardware and software)
- **Quantum Key Distribution (QKD) (NCC & CFMS):** Access to a quantum-secure network and test bed to demonstrate and test secure, remote communications for design and manufacturing applications
- **Fully functional cellular technology facilities to bring solutions out of R&D for testing as an early real-world deployment at Digital Catapult (London and Brighton):** Open access and expert technical support to innovators wanting to test and develop 5G-enabled services and applications
- **Centre for Machine Vision (BRL, UWE):** expertise and facilities in innovative machine vision and state-of-the-art machine learning for demonstrating how automation can improve manufacturing processes, for prototyping and validating new innovations
- **Smart Internet Lab:** Based at the University of Bristol, it is one of the UK's most renowned Information and Communications Technology (ICT) research centres which addresses grand societal and industrial challenges across IoT, 5G & beyond, Future Transport Networks, Smart Cities, Autonomous Networks, Machine Learning, Artificial Intelligence, Network, Convergence, Mobile Edge Computing and Network Softwarization
- **A fully integrated R&I facility for advanced propulsion systems (University of Bath):** that can handle complete vehicles, individual systems or single components through bespoke cell configuration, utilising the latest measurement equipment designed to offer partners timely, consistent, accurate and repeatable data, analysis and results

To access the range of DETI and partner industrial test beds and discuss your requirements, email **deti@nccuk.com**

Partner

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