Digitalisation, the key to a globally competitive, more sustainable zero-emission UK automotive industry

Digital technologies are transforming the way our industry operates. Already integral to business operations, they act as enablers for mass data-storage, real-time predictive analysis and rapid prototyping. In addition, digital twins are helping us to simulate and replicate real situations and optimise outcomes, helping us to reduce development lead times, automate and replicate existing processes, build efficiency, minimise waste and reduce costs. As the digital transformation progresses, we are increasingly seeing the use of AI tools that scroll through data, generating scenarios and algorithms to enable the making of real-time decisions. Digitalisation is fundamental for the swift introduction of new zero-emission technologies, full lifecycle analysis and the decarbonisation of our manufacturing industry.

We are just at the start of the digital transformation journey, our goal is to position the UK as a recognised global leader in the digital arena. Here, at the Advanced Propulsion Centre UK (APC), we recognise the significant opportunities open to our automotive industry and as such digitalisation has now become a priority focus area within our CR&D competition scope.

Can your digital technology support these strategic industry targets:

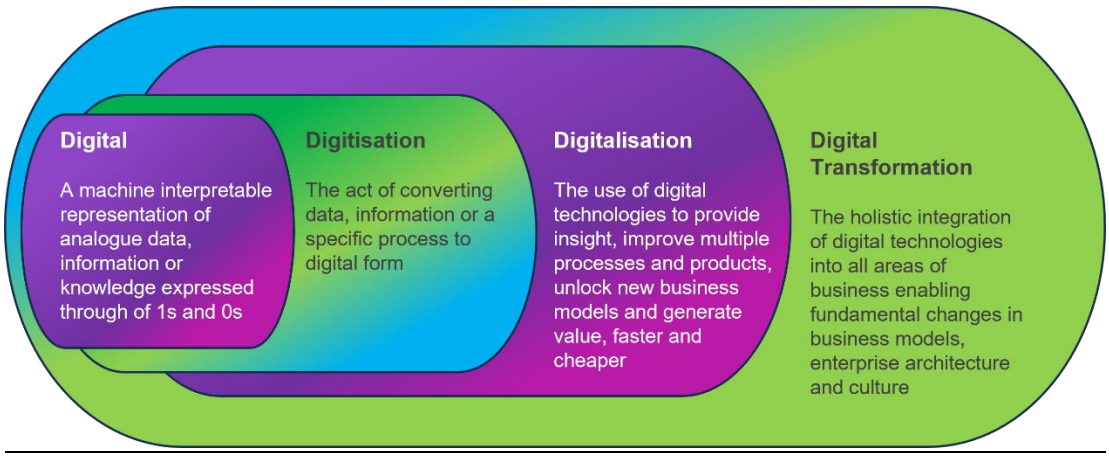
- Transition to net zero
- Rapid prototyping, product and process simulation
- Lifecycle analysis
- Cybersecurity
- Connectivity
- Virtual assurance and certification

Does it fit into our digital maturity framework?

Digital tools have been used within the automotive sector for decades and many of the projects we've helped to deliver over our 10-year lifespan have had digital content. To deliver on the industry targets above, the sector needs to undergo a significant transformation. For this to happen we need to shine a spotlight on the digital technologies that will enable this change.

Understanding digital maturity

In 2020 the Institute of Digital Engineering (IDE) produced a clear definition of the four steps in Digital Maturity



Ref: IDE Digitalisation Roadmap - Institute of Digital Engineering (ide.uk)

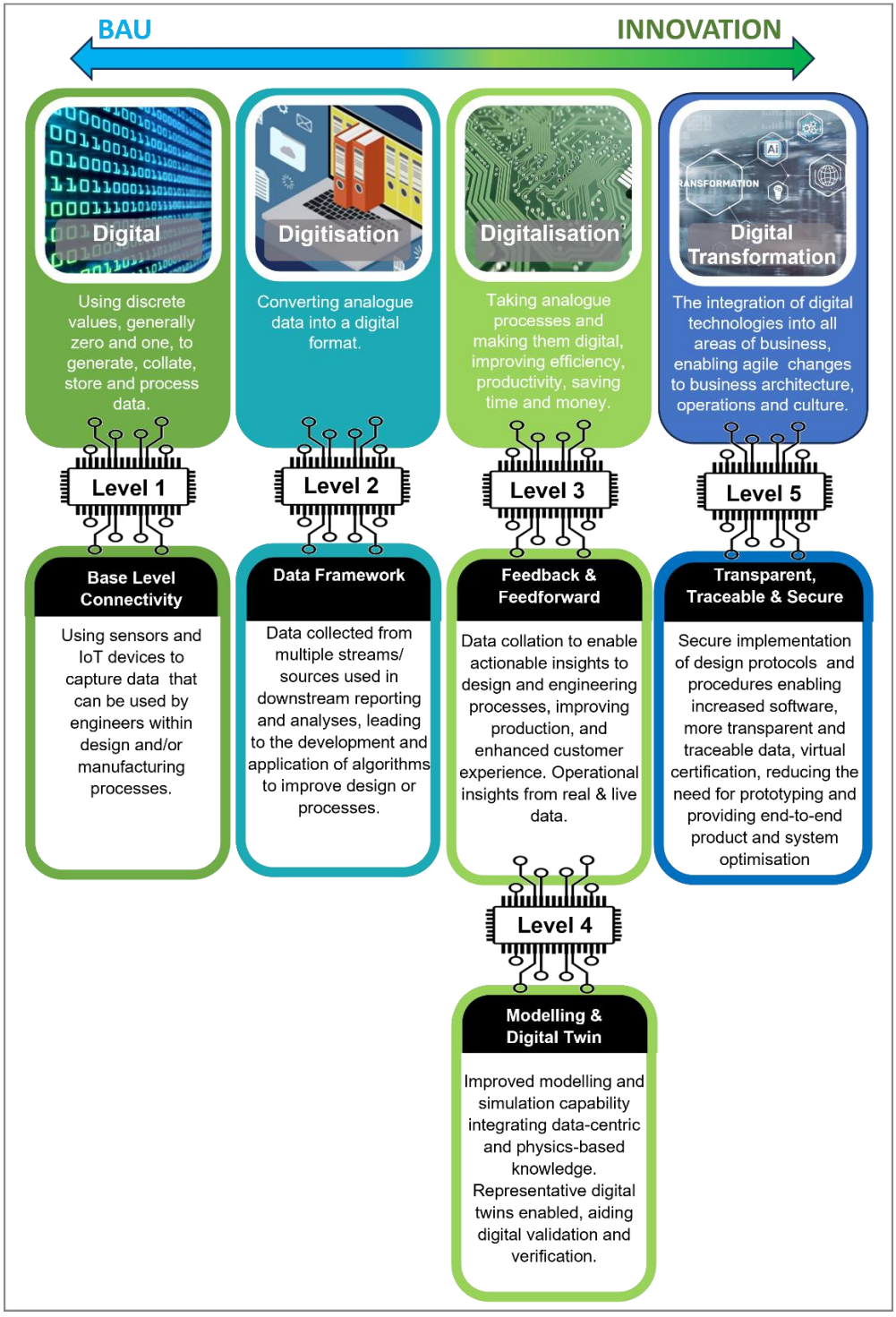
The APC views steps 1 and 2, "Digital" and "Digitisation", as standard tools already utilised by industry. For CR&D projects to be considered innovative, your consortium (or specific programmes of

work) need to demonstrate how you will deliver the “Digitalisation” and “Digital Transformation” sections of the model.

All automotive industry players need to identify their digital maturity level, before developing and/or deploying digital technologies into their innovation and R&D programmes.

We have adapted and expanded the IDE digital maturity model to create a framework that will help you more easily understand our judging criteria for digitalisation projects.

The Advanced Propulsion Centre’s Digital Framework



How to apply the framework

Consortium partners should state where, within our Digital Maturity Model, their proposed project fits, and provide additional information within the work packages to show which level of the Digital Framework applies.

We appreciate your project may span several of the levels in the model. To help you understand how you can position your technology we have worked through some examples, using existing case studies as a base.

Example 1 - Ford

Ford ViVID case study

ViVID (Virtual Vehicle Integration and Development) was a collaborative research project to develop digital engineering tools. Key deliverables included:

- Building Computer Aided Engineering (CAE) for a real-time, multi-faceted digital simulation environment
- Advancing a digital engineering toolchain deployed to the next generation Transit van
- Promoting model-based systems for the design and verification of the virtual product development process
- Demonstrating a new analytical approach to the engineering process to enable the next generation of electric vehicle technology to be developed
- Reducing reliance on serial engineering and physical prototypes

Several strong elements of Digitalisation (Levels 2,3 and 4)

Example 2 – Ox delivers

OX Delivers case study

Delivering advanced, affordable EV technology and a digital ecosystem to optimise operating costs and minimise capital expenditure. The OX Delivers digital solution:

- Combines a real-world performance monitoring vehicle with off-board digital twins, automated testing and manufacturing systems
- Accelerates design change implementation process and rapid replication

The project enabled Ox to create a feedback loop from vehicle service back into design in order to optimise product design and increase operational performance.

Strong elements of Digitalisation (Levels 3&4) and has helped prepare the business for a complete Digital Transformation (Level 5).

Example 3 – Wrightbus

Wrightbus Translink case study

This project was focused on leveraging emerging technologies in support of global supply chain risk management:

- Applying multiscale modelling and digital twin capability to enhance development and in-service vehicle performance optimisation.

Strong aspects of Digitalisation (Level 4), and laying the foundations for Digital Transformation (Level 5).

Helping you build a strong application

To help you formulate your digital work packages we have created a journey map, these are all questions you may want to consider when completing your application.

These questions are here to act as a guide and so are we. If you have any questions about our digitalisation strategy, please contact us, we would be more than happy to provide further support and guidance info@apcuk.co.uk