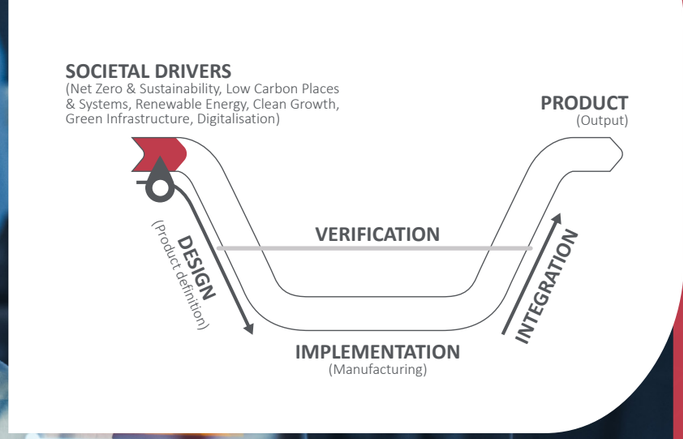
Re-imagining sustainable products of the future



CHALLENGE

Developing and designing a product is a complex process which involves thousands of computer aided design iterations, followed by building and testing multiple physical prototypes of what the product will look like in real life. Very often, the product that is manufactured is different from the original design because of the changes that the design goes through to ensure that it is safe, sustainable and meets the requirements of the customer. To deliver a shift to low-carbon, the design process also needs to have sustainability built into it from an early stage.

RESULTS AND THE DIGITAL OPPORTUNITY

The DETI Partnership has researched and analysed a range of new digital technologies and tools that companies can use when designing and manufacturing sustainable products, to help to create better products, and in a shorter timescale- potentially reducing costs.

These technologies enable industry to digitally view and understand how users will interact with their product from many different angles, which can't usually be seen until the product is made. Presenting a very accurate 3D image of what it will look like when physically produced, these technologies allow designers to test and review the product on screen.

The technologies will also empower manufacturing to visualise processes that are normally hidden from view. Additionally, training of individuals can be deployed in a safer, and more cost effective way prior to exposure to the real product and environment.

In sectors like marine and aerospace where product development lifecycles are often lengthy, costly, and high performance is critical, this technology could dramatically reduce environmental impact by generating less waste throughout the prototyping stage.

DETI's research has examined best practice for the presentation and visualisation of design and manufacturing data, using immersive technologies, specifically Augmented Reality (AR) and Virtual Reality (VR).

Augmented Reality (AR) describes the environment in which real objects or products are inserted into computer-generated virtual environments.

Virtual reality (VR) is an artificial environment that is created with computer software that is like the real environment.

Product Design

AR allows designers to see a product during development in context, at low cost. Engineers can access this technology through a mobile device, using the camera function to project a dynamic image of their product or prototype in situ providing insights into its benefits and limitations.

Remote Inspection

Remote AR assistance can enable real-time collaboration between field maintenance engineers and on-site teams by displaying crucial images and work instructions in the real world when repairs and servicing are required. For example, this means work can be carried out remotely on a commercial aircraft with exacting guidance and an intuitive experience for the engineers. From a sustainability perspective, AR equips businesses to overcome challenges more quickly, without the need for potentially wasteful rework or the physical movement of products and teams.

Learning and Training

AR training can support engineer education via on-the-job and classroom training, by offering an intuitive experience for visualisation of procedures and conceptual information. In industries where product quality is highly dependent on the personal skill of the engineer, AR provides a focused and practical training method, imparting hands-on guidance.

The UK is currently Europe's largest market for VR and AR, tapping into what is predicted to become a $160 billion immersive technologies market. It is a vibrant, growing market which will revolutionise many sectors including education, training, healthcare, manufacturing, construction, retail, and ecommerce.

With our report in place, DETI's next challenge is to produce a toolset to help organisations and sectors find solutions to their challenges through the use of immersive technology.

Partner

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