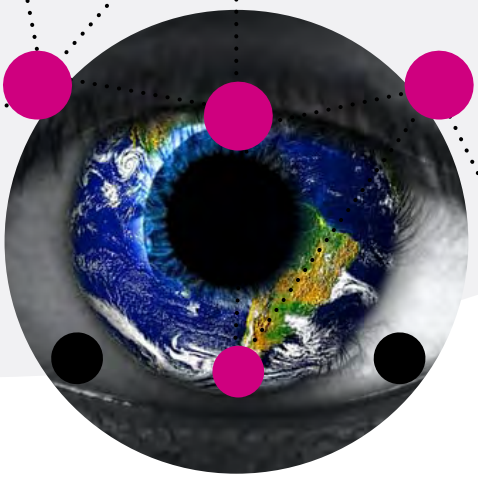

NICER PROGRAMME & INNOVATE UK

CIRCULAR ECONOMY FOR SMEs

Twist

UKRI Interdisciplinary Centre for Technology Metals

NICER PROGRAMME

UKRI Innovate UK

DIGITAL PLATFORM TECHNOLOGY RESEARCH TO ENABLE PRODUCERS TO ACHIEVE GREATER PRODUCT LONGEVITY AND BETTER END OF LIFE SOLUTIONS

Twist collaborated with the UKRI Interdisciplinary Circular Economy Centre for Technology Metals (Met4Tech) to undertake a circular economy innovation project, funded by Innovate UK in collaboration with the UKRI NICER Programme. The project aimed to enhance their digital platform approach to help consumers move to more sustainable consumption, and Twist worked closely with Met4Tech to ensure key stakeholders were active in the project. In this case study, we explore the key insights and outcomes of this collaboration, and how it has contributed to advancing circular economy knowledge, capacity and capability.

The Challenge: What We Were Trying to Achieve

When building Twist, we realised that to have a complete and realistic view of a product lifecycle, data and insights on components were going to be crucial. Measuring a product lifecycle is easier in theory than in practice. You can estimate the length based on what you believe the material in the product will last, but without data on how it's being used, how it performs in different use cases and how the components react to those different scenarios, you are not making decisions based on a complete picture. Components generally have shorter lifespans than a full product. For instance, a battery is likely to last less than a bike frame, and a motor less than a robot arm. With this project, we aimed to investigate Original Equipment Manufacturers' (OEMs) perspectives on their components, their tracking methods, manufacturing challenges, and the potential benefits of additional data and insights. By doing so, we aimed to help them make more informed and sustainable decisions for their products, businesses, and customers.

The Approach: How We Tackled the Challenge

We approached this project the way we would any R&D project we have at Twist.

Continuous research and discovery:
We started the project with an extensive research phase. Here we interviewed Twist customers, ecosystem players and other OEMs which are not Twist customers. Here we had massive help from Innovate UK and our partner Met4tech, who introduced us to crucial contacts. Most of our insights came from companies like EAV, Cake, Becker, TIER mobility and others who we interviewed throughout the project. Our research approach started with broad questions about components, manufacturing, and data. As the project progressed, it became more about feedback on the prototype. We also wanted to find out how and if our customers have a sense of priority when it comes to components.

User journeys and no-code prototypes:
After our initial research phase, we needed to find out more about data gathering and insights creation. More specifically, we needed to find out what requirements are for gathering the correct data. We also wanted to make sure we build a system that makes the data gathering as easy as possible. We adopted a prototyping approach to obtain consistent feedback from customers on the ease of use and functionality of the system, including graphs and insights. The feedback we received informed our technical roadmap. Throughout the process, we received valuable support from Met4tech, who provided insights and feedback on the system.

> *"We had a list of assumptions about how components would impact a business operating a circular business model. We didn't realise exactly how valuable the data would be to help our customers make much better decisions for their assets and their business."*

Technical feasibility and live prototype:
The process culminated in a technical feasibility study, which we conducted using data from our customers CAKE and EAV. We focussed our efforts on one component that was important to both: batteries. Addressing one highly prioritised component enabled us to provide insights and learn, before continuing to build the system to work for multiple types of components.

Roadmap:
At the end of the project, we produced a clear roadmap, co-produced and validated with customers. This provided clarity on what was required to get this feature live in the platform, which we are very close to releasing.

Unexpected Outcomes: What We Learned Along the Way

Our project was intentionally broad and ambitious from the start. It included a group of assumptions that were later excluded from the project as invalidated by customers, which is all part of the R&D process. More unexpected was how much of the data we collected would be of use in the supply chain. There appears to be a big opportunity for the data this project is providing to help OEMs with complex discussions around warranty, improvements or even changing suppliers.

Key Learning: What We Would Do Differently Next Time

This project was our first Innovate UK grant, and hopefully not the last! We learnt a lot about systematically managing a grant project so next time we'll be even more organised in capturing the activities, time and effort upfront to make the reporting simpler. We also underestimated the time it would take to get to the right person at bigger corporations, but with support from our partners we managed to talk to several key stakeholders throughout the project.

The Outcome: What We Achieved and How It Has Impacted the Business, Society and Key Stakeholders

We had a list of assumptions about how components would impact a business operating a circular business model. We didn't realise exactly how valuable the data would be to help our customers make much better decisions for their assets and their business. The outcome of the research has led to work directly and indirectly impacting the main Twist platform. It led us to build out our data model and templates for customers to use and extend our live LCA model on our website. We've now also incorporated some of the prototype we built directly in the platform to calculate product failures and component costs. Overall, the project has led to us having more conversations with bigger companies about lifecycle extensions and it has led to an increase in revenue and custom for Twist.

Looking Forward: Next Steps and Future Directions

We produced a clear roadmap for how to incorporate our research into the platform that we are currently prioritising and breaking down into deliverables. It's also spun out multiple new potential streams of work. One example we are currently exploring is a machine learning model that predicts when components are going to need to be changed or has reached their lifespan. This work will help Twist customers improve their service and ensure they extend their overall asset lifecycles and lower their impact.

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Research was carried out by Twist with support from the UKRI Interdisciplinary Circular Economy Centre for Technology Metals.