Case Study

Turning Digital Twin Modelling into Decision-Ready Insight

/ Connected Places Catapult

Connected Places Catapult is the UK's innovation accelerator for cities, transport, and place action. Operating as part of the Innovate UK Catapult Network, the organisation connects businesses, academia, local authorities, and central government to accelerate the commercialisation of emerging technologies. Its programmes span mobility, the built environment, and critical data infrastructure, turning complex public challenges into real-world, sustainable solutions across the UK.

" The engineering team took a complex, map-based interface and made it look easy. They brought our agreed vision to life with real quality, adapted quickly as our thinking changed and kept improving the app with every iteration "

Ana Nunez Lopez - Operations Director

Case Study

Project Introduction

Engineering delivery of the user-facing application for Connected Places Catapult's Climate Resilience Demonstrator (CReDo), a digital twin platform that models how extreme weather affects interdependent critical infrastructure networks. NewRedo built the user-facing application within a blended team, collaborated on user research and UX design and back-end modelling. The work covered front-end engineering, API integration with modelling outputs, visualisation of cascading infrastructure risk, iterative delivery from a shared backlog, and support for a service now in field trials.

Project Challenge

Climate change is increasing how often and how severely extreme weather hits the UK's critical infrastructure. Energy, water and telecoms networks are deeply interconnected, but they are usually planned and run separately. That makes it hard for operators to see how a flood or heatwave affecting one asset could cause failures across other sectors.

- Connected Places Catapult needed to turn sophisticated digital twin modelling into a service that infrastructure owners and operators could actually use to make decisions.
- Modelling outputs had to become clear, usable insight for operational, planning and policy users.
- Six organisations contributed different expertise, data and priorities, so design, engineering and modelling needed tight coordination.
- Information about vulnerable critical assets needed careful access control and responsible presentation.
- User research was refining the service direction during delivery, so engineering had to adapt quickly.
- A small team had to focus its effort where it would deliver the most value.

The broader challenge was to build a dependable, usable front end on top of research-grade modelling. It had to keep up with fast-moving user-centred design while staying stable enough for real-world field trials.

Project Solution

NewRedo provided the engineering capability within a blended, multi-partner team. Each partner focused on its specialism, and all of them worked towards a single shared outcome.

- Clear partnership roles: Thunk led user research and experience design, and the academic and research partners provided the back-end modelling. NewRedo owned the engineering of the user-facing application.
- One team, one backlog: Designers, researchers and engineers worked from a shared backlog and in shared delivery rhythms rather than through sequential hand-offs. This cut rework and made sure designs could be built as intended.
- Engineering for evidence-led change: When research showed that only one of three candidate service directions was worth pursuing, engineering effort quickly refocused on that option.
- Integrating modelling outputs: We built the interface between the user-facing application and the back-end models, so users could explore weather scenarios, assets and cascading risk in one coherent experience.
- Making complex risk understandable: Working closely with the design team, we engineered visualisations and journeys that make interdependencies across energy, water and telecoms networks clear enough to act on.
- Responsible handling of sensitive data: The application was built with access control over sensitive critical-asset information in mind.
- Traceable decisions: Engineering work stayed linked to a shared, live design history connecting research findings, prototypes and decisions.
- Readiness for field trials: We delivered a stable application that could move from prototype into real-world field trials.

Customer Value Proposition

CReDo is now a working service in field trials, supporting Connected Places Catapult's goal of an ecosystem of digital twins that help the UK adapt its infrastructure to climate risk.

- A working user-facing application that turns complex digital twin modelling into usable insight on cascading infrastructure risk.
- Successful delivery across six organisations, with clear roles and a shared backlog.
- Engineering effort focused on the service direction research showed would deliver the most value.
- A service now in field trials, with ongoing testing guiding product decisions.
- A traceable record linking research, design decisions and engineering delivery.

Project Skills

Digital modelling, Geospatial visualisation, UX Design, Front end development, UX Testing, Agile Delivery Management, Blended, multi-partner delivery, MVP Delivery, Stakeholder Collaboration, GDS Service Standard