



University of Bristol

BDFI builds world-first research hub



The BDFI partnered with Fujitsu to deliver a powerful data centre environment for its Reality Emulator. The secure research environment supports digital twin modelling, VR and collaboration across academia, industry and communities to support innovation.

Challenge

The BDFI needed a secure, scalable and sustainable data centre environment to support advanced digital research and collaboration across sectors.

Solution

Fujitsu delivered a software-defined data centre with secure multi-tenancy, custom monitoring, hands-on training and ongoing support to help BDFI establish and manage the Reality Emulator.

Outcomes

- Accelerates innovation, scientific discovery and real-world problem solving
- Enables advanced, immersive research methods
- Fosters cross-sector collaboration at scale

“The Reality Emulator accelerates vital research and enables people to collaborate in entirely new ways, with the potential to drive meaningful societal impact.”

Professor Daniel Neyland, Co-Director, BDFI



1st

research facility of
its kind globally



Accelerates

scientific discovery and
real-world problem solving

From data to social impact: Fujitsu's role in BDFI's Digital Twin research ecosystem

As part of the University of Bristol, the Bristol Digital Futures Institute (BDFI) is reimagining how society and digital technologies shape one another. Its mission, 'to do digital innovation differently', brings together interdisciplinary academics with commercial and community partners to address complex societal challenges through digital innovation.

"We're in a fast-moving world where digital innovation raises new questions about sustainability, accountability, ethics and privacy," says Professor Daniel Neyland, Co-Director at BDFI. "Tackling these demands requires new research methods."

In November 2024, BDFI launched the Reality Emulator, a secure research environment featuring a VR-enabled CAVE (Cave Automatic Virtual Environment) for immersive visualisation powered by a secure data centre with parallel computing and integrated 5G. Designed to support commercial, academic, and community use, the aim of the platform is to enable future-focused problem-solving that supports a more sustainable, inclusive society through the creation of social digital twins.

Funded by Research England and expected to benefit up to eight million people, the project required a trusted partner with proven expertise in building resilient, sustainable and high-performance data centre environments.

A world-first scientific research facility

Following a competitive procurement process, the BDFI selected Fujitsu to deliver the Reality Emulator's data centre infrastructure. "Fujitsu provided invaluable guidance from day one," says Nick Hall, former Operations Director at BDFI. "The team helped us refine our requirements and stay within budget."

At the heart of the platform is a 2PB software-defined data centre, built for scalability, high-performance and secure collaboration. The environment integrates Fujitsu's high-performance hardware with NVIDIA GPUs and a Juniper network fabric to ensure seamless, reliable connectivity.

As a multi-tenant secure research environment (SRE), the Reality Emulator enables diverse partners – from academics to industry and local communities – to collaborate independently without compromising data security or intellectual property.

Fujitsu led the design, deployment and integration of the full infrastructure stack and developed a custom management and monitoring interface, giving BDFI clear visibility and control across the platform. "Fujitsu has been incredibly supportive in helping us explore new projects, working with our partners and quickly resolving any issues with the groundbreaking technology," adds Neyland. "For such a complex project, it's run remarkably smoothly."

To support BDFI's goal of self-sufficiency, Fujitsu also provided tailored documentation, hands-on training and ongoing support, including a full year of post-deployment assistance and 20 days of on-demand consultancy.

For Hall, the success of the innovative Reality Emulator project hinged on effective knowledge transfer (KT), and Fujitsu delivered beyond expectation. As he notes, "Fujitsu's unwavering commitment and customised approach to KT have been nothing short of exemplary. This dedication has fostered a genuine 'One Team' spirit and facilitated a seamless transfer of skills to our internal team, ensuring we are well-equipped to tackle future challenges."

Industry:
Education and research

Location:
UK

Website:
bristol.ac.uk

About the customer

The Bristol Digital Futures Institute (BDFI) is a research institute at the University of Bristol that brings together researchers, industry and communities to explore how digital technologies shape our world. Focused on interdisciplinary collaboration, BDFI supports innovative projects that drive social, economic and environmental progress through responsible digital innovation.



Enables

advanced, immersive
research methods

Powering innovation through immersive, collaborative research

As a world-first facility, the Reality Emulator not only positions the University of Bristol as a global leader in digital innovation but also serves as a powerful draw for top academic talent and industry partnerships.

Now fully operational, the Reality Emulator is supporting groundbreaking research across academic, commercial and community sectors. Thanks to BDFI's strategic partnership with Fujitsu, the underlying data centre environment is robust, scalable and easy to manage, allowing new research environments to be spun up at the touch of a button.

The secure, high-performance platform facilitates sophisticated experimentation and can be deployed to tackle a wide range of issues. Currently, BDFI is developing applications in urban planning, immersive training and environmental research. However, the potential of digital twins extends beyond these areas, offering solutions for a myriad of other fields, including carbon reduction, transport and health. It also fosters cross-sector collaboration, offering a unique environment where researchers, civic groups and industry can work side by side.

Real-world applications already underway include:

- Immersive training: Mixed reality experiences for workforce upskilling, accessible without headsets and ideal for high-cost or hazardous scenarios.
- Community engagement: A collaborative project between the Knowle West Community Centre and Fujitsu to explore how digital tools can address community needs.
- Environmental research: One project modelling methane emissions and another using live data to display energy consumption building-by-building to support sustainability initiatives.
- Gaming for good: A games lab that unites content creators and researchers to simulate real-world scenarios.
- Forest monitoring: Immersive digital representations of European forests to study the forest canopy, biodiversity and carbon capture from a new perspective.
- Protein visualisation: Global scientific collaboration to visualise and model novel proteins in ultra-high definition using shared virtual environments.
- The UnMuseum Project: Supporting a project led by the Black South West Network to co-create an accessible digital heritage archive for black and racially minoritised communities.

"Fujitsu was an exceptional partner," says Hall. "The team's ability to integrate complex technologies into a seamless, high-performance platform was critical to the project's success. Its collaborative approach has laid a strong foundation for future innovation and growth."

Following the successful delivery, Fujitsu is now a fully integrated partner, actively collaborating with BDFI researchers and investing in the development and application of digital twins to address societal challenges across industry sectors.

Customer:



Fujitsu

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