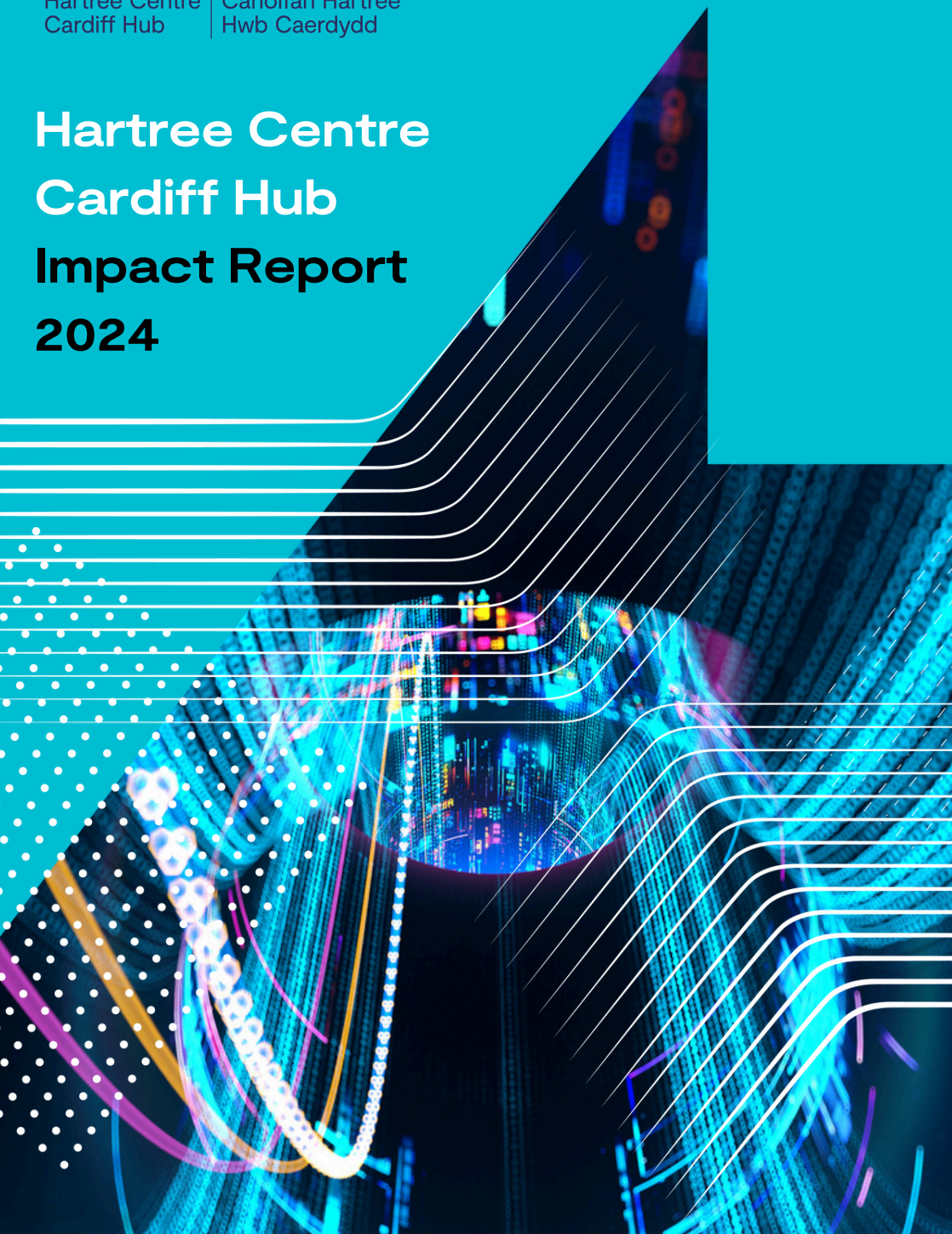UKRI

Science and
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Hartree Centre Cardiff Hub Impact Report 2024

Directors' Note

Looking back at our first year of delivering artificial intelligence (AI) and data science support to small and medium-sized enterprises (SME), we are immensely proud of all the work that's been achieved by our team working in partnership with Cardiff Capital Region and Western Gateway companies.

Every SME is at a different place in their AI and data journey, but face similar challenges in working out how best to exploit these revolutionary new technologies to move their business forward. We've been privileged to work with a diverse set of innovators across sectors including Creative, FinTech, MedTech, Net Zero, and Security.

Whether it's via a short-term Assist (up to 12-hours of work with a company), a sprint Project (1-3 months), or engaging with us at one of our 'Demystifying AI' sessions, we gain inspiration from understanding a company's requirements and helping them work out the next steps on their AI pathway.

This report aims to capture a few highlights of our first year, illustrating the ways we're providing locally-accessible support to the region, and generating socio-economic impact for UK businesses.
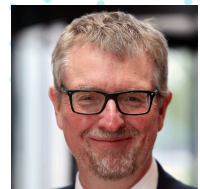
Dr Yulia Cherdantseva, Dr Kathryn Jones, and Professor Alun Preece
Hartree Centre Cardiff Hub Directors

What we offer

Engagement - SME attendance at in-person or hybrid briefing and networking events.

Assistance - 12-hour (approx) support from the Hub team to the SME.

Projects - 1-3 month collaboration between the SME and the Hub team, focused on developing and testing a specific idea.

We provide SMEs with access to the large base of AI and data science research and innovation expertise at Cardiff University, at no financial cost to the companies.

Where are our SMEs?

3%

5%

60%

5%

5%

3%

3%

3%

13% Outside region

In the past year we have...

Engaged with 115 SMEs

Provided 1,300 hours of AI assistance

Committed £125,000 of AI support

Sectors our SMEs operate in

Other 20%
Creative 20%
FinTech 15%
MedTech 15%
Net Zero 10%
Security 20%
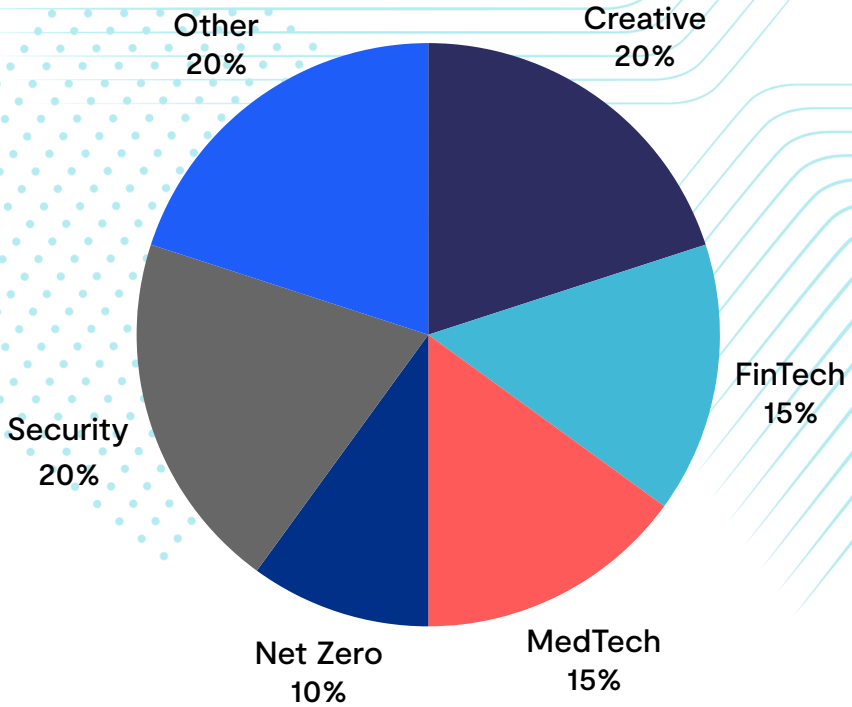
The STFC Hartree Centre Hubs help UK businesses and organisations of any size to explore and adopt supercomputing, data analytics and artificial intelligence (AI) technologies for enhanced productivity, smarter innovation and economic growth.

Innovator Spotlight – GroupEd

"Why can't we do amazing tech things in Wales? By focusing on making connections and creating public value, our ability to solve problems is endless."
Cerys Furlong, GroupEd

Cerys Furlong is CEO of **GroupEd**, an EdTech startup looking to make an impact in the area of school management.

She said "My background is in the voluntary and public sectors; I've been in influencing, lobbying and campaigning roles but never in tech. But I've got a brain that tries to solve things – I see a problem and I try to fix it."

That's what GroupEd is doing in the education space. They recognised that schools are holding large amounts of data, often across platforms, which can be onerous to manage but can offer a lot of insight. "There's an opportunity to make better use of the data that schools hold, to enable decision-making and improve education."

Innovator Spotlight – GroupEd

GroupEd approached Hartree Centre Cardiff Hub to understand more about how using AI could speed up data processing using large language models and free up time and resource so that teachers could focus on teaching, administrative staff could solve bigger issues. Their Assist and subsequent project with the Hartree Centre team has helped them to see other possibilities.

"It's always useful to have a different set of eyes on the challenge and to avoid getting stuck in 'the now'. The data scientists we've worked with at the Hartree Centre shared our language and raised our ambitions."

GroupEd is now embedding AI into their platform, offering translation services to ease engagement between home and school in community languages.

grouped.org.uk

Hartree Centre

Identifying the right digital solution for your business

Technology Focus – Generative AI

Rusty Design

Rusty Design is an award-winning company providing novel product design and innovation, rapid prototyping including 3D printing, and small-scale manufacturing services. They operate in sectors including manufacturing sports equipment and props for the television and film industries.

Hartree Centre Cardiff Hub experts, supported by Professor Yukun Lai of the Cardiff University School of Computer Science and Informatics, recommended the most promising generative AI approaches to automate the creation of objects, assign textures and create a library of digital objects. This was followed by implementing these techniques using the company's object models.

Technology Focus – Generative AI

Rusty Design

Increasingly, the TV and film industry is making use of on-set virtual production, where it becomes important for creatives to move seamlessly between physical and virtual environments. Sustainable methods, limiting the environmental impact of both physical and virtual production, is also a key factor. Rusty Design's innovative processes, augmented by the use of AI in their workflows, are intended to enable agile and sustainable production.

The guidance the Hartree Centre Cardiff Hub provided helped Rusty Design acquire Innovate UK funding from the Creative Catalyst.

rustydesign.co.uk

"Without the support of the Hartree Centre Cardiff Hub, we wouldn't have been able to access the expertise we needed and unlock the path forward for our future projects around generative AI, readying us for commercialisation. Our interactions have paved the way to a new Innovate UK project."
Bleddyn Williams, Rusty Design

Innovator Spotlight – Menna

"Anyone who has any experience in startups knows that time is precious. Working with Hartree Centre Cardiff Hub has added resource at a crucial time in our journey."
Dan Mines, Menna

Menna aims to support small businesses to understand their financial position in a clear, helpful way and to manage their finances better. Acting as a lending platform, it matches small businesses to eligible finance options, allowing both sides to make better decisions.

"It's important to us that people have as natural an experience on our platform as possible and are not aware of the tech as they're using it. We're interested in creating a human-like experience that replaces traditional avenues of support that aren't there for small businesses anymore," says Dan Mines, who co-founded Menna alongside Nick Carlton. "I did my undergraduate and postgraduate degrees at Cardiff University, and I was drawn back to the vibrant tech scene in south Wales when we started working on this product."

Innovator Spotlight – Menna

"Our project with Hartree Centre Cardiff Hub will enable us to scale. Our goal is to use open-source or our own language models as we learn more about the user. In the meantime, we have partnered with Google Gemini as our foundational model.

"Our project aims to distinguish the tipping point for us as a business when it becomes worthwhile to invest in expensive hardware and scale our business."

menni.ai

SimplyDo

Our digital landscape is evolving rapidly, and protecting our personal data has never been more important. **SimplyDo**, who work with sensitive industries such as defence, policing and healthcare recently performed an assist with us and our experts, enabling us to provide them with significant knowledge transfer for using Artificial Intelligence in their work.

Data sovereignty requirements not only mandate that customers remain in complete control of their own data through our services, but also that the data is processed and stored fully within pre-agreed geographic and virtualised locations. For example, many of SimplyDo's customers require that their data is fully managed solely within the UK.
In recent years the world has observed explosive growth of generative AI across a range of media, including text, images, voice, and even video. Many organisations have been rushing to leverage these exciting technologies to empower their own services, or even to build entirely new and previously impossible categories of standalone products.

Despite the convenience of off-the-shelf closed-source AI services such as OpenAI, there are uncertainties involved in the opacity regarding how data inputs are handled behind the scenes.

SimplyDo

For example, in typical text summarisation, SimplyDo would need to expose customer data for it to be processed by the service, and it is not always clearly understood how such data will be processed. For SimplyDo, such uncertainties would reduce their ability to confidently safeguard their customers' data with respect to both security and sovereignty.

Working with the Hartree Centre Cardiff Hub allowed the SimplyDo team an opportunity to gain knowledge and know-how to deploy and run their own open-source AI models in-house whilst understanding the applications of different model types and trade-offs in model complexity and computational cost. The Hub provided SimplyDo with sample code to help demonstrate these applications and trade-offs.

simplydo.co.uk

"Throughout the experience, the team were highly positive and clearly listened and understood our challenges and were able to help us with relevant and practical insights that we have already been able to use in progressing AI deployments in our products."
**Dr Will Webberley, SimplyDo**

Technology Focus – Chatbots and LLMs

In July and October 2024 the Hartree Centre Cardiff Hub ran 'Demystifying AI' events focusing on chatbots and large language model (LLM) technologies. Across the two events, 22 SMEs received an introduction to these new, groundbreaking technologies, an analysis of key business applications, and a set of demonstrations to bring the technologies and applications to life. The events were also attended by representatives from Welsh and UK Governments.

Kyle Hatchard, Digital Innovation Lead at STFC Hartree Centre said, "The Hartree Centre SME Hubs are driving national impact across the UK, empowering regions for 1:1 support, engaging with digital pathways to de-risk and upskill businesses."

The events closed with opportunities for the attending SMEs to discuss 1-2-1 with members of the Hartree Centre Cardiff Hub team to develop the next steps in their AI journeys.

Further events will be scheduled in 2025. To find out more, email **hartree@cardiff.ac.uk**
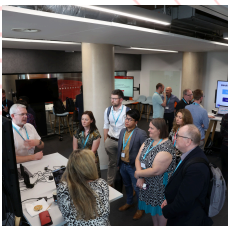
"Understanding the excellent services available through Cardiff University and the Hartree Centre has opened my mind to south Wales as a location for business."

Meet a few of our team

Ahmed Abdellah (Data Scientist)
Ahmed joined our team as a Data Scientist at Hartree Centre Cardiff Hub in 2023.
Ahmed completed his MSc in Speech and Language Processing at the University of Edinburgh. After graduating he spent two years at award winning AI startup Emotech, during which he was instrumental in developing Arabic Text-to-Speech systems.
He is passionate about harnessing AI for social benefit, particularly in the use of Conversational AI in educational settings to enhance learning experiences.

Cai Davies (Data Scientist)
Cai is a Data Scientist at Hartree Centre Cardiff Hub and a Research Associate with Cardiff University's Security, Crime, and Intelligence Innovation Institute.
Cai is currently a part-time PhD student within the School of Computer Science and Informatics at Cardiff University. His research focuses on multi-modal information discovery and knowledge management.

Luiza Patorski (Business Liaison)
Luiza is the first point of contact for most businesses approaching Hartree Centre Cardiff Hub and guides companies along their journey of working with us.
Luiza has a lot of experience in the world of science communication and also looks after the Outreach team within the School of Computer Science and Informatics at Cardiff University, delivering workshops in schools, although originally came from a biochemistry background.

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cardiff.ac.uk/hartree

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