

Sustainability Exploration and Environmental Data Science (SEEDS) Programme

In partnership with academia, and
collaborating with the United Nations
Industrial Development Organisation.



An imperative for today's organisations is defining and achieving a successful sustainability strategy. Organisations adopting such a strategy must align with global efforts to mitigate and build resilience to climate change, and boost biodiversity.

This is not only an ethical and environmental imperative but also a strategic business decision that can positively impact an organisation's reputation, regulatory compliance, competitiveness, reduce operational costs and resilience in the face of global challenges.

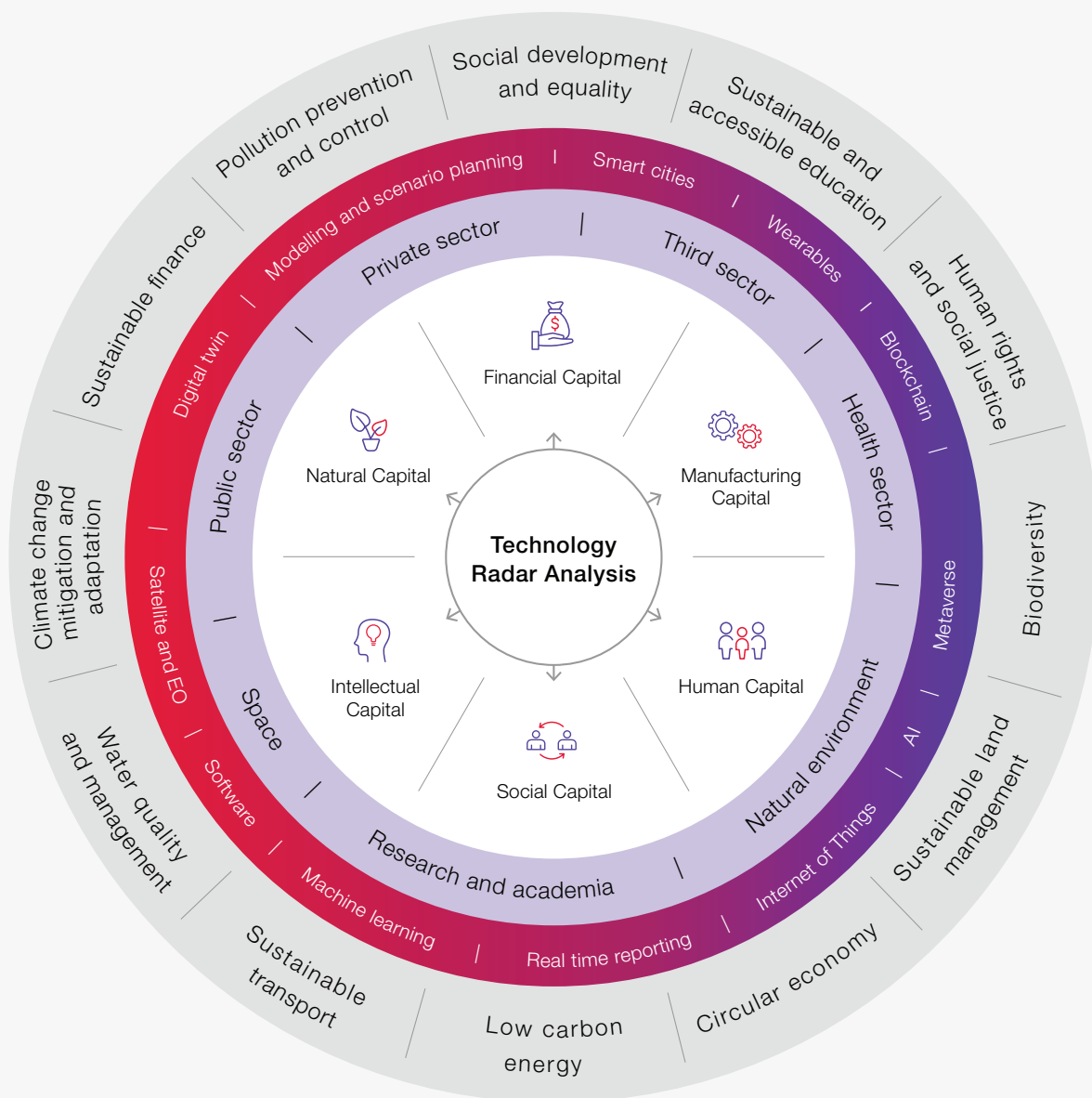
CGI's Sustainability Exploration Environmental Data Science (SEEDS) programme in partnership with academia and collaborating with the United Nations is developing ground-breaking technology products and solutions that can benefit governments, businesses, and individuals in support of complex sustainable development.

SEEDS is harnessing the power of technology, research, innovation and collaboration to create positive environmental, economic, and social change and to foster access to technological sustainability solutions. The programme supports the ambitious, United Nations' Sustainable Development Goals (SDG) through driving forward inspiring research to develop transformational new technologies and solutions.

CGI and our SEEDS partners are accelerating efforts to enhance sustainable development and strengthen research and innovation for our clients, the environment, and the communities in which we live and work. Research areas include climate mitigation and adaptation solutions, solutions, water resilience, nature capital accounting solutions, chemicals and waste reduction solutions, and supply chain sustainability.

Advancing research and technology is key to unlocking low carbon solutions and innovations to enable the development of net-positive and sustainable business models that empower communities, and our clients to achieve sustainability goals.

Sustainability Exploration and Environmental Data Science Programme Overview



- Capitals of value creation
- Partners and stakeholders
- Technology solutions
- Sustainable transformation

The United Nations

17 Sustainable development goals



Collaboration to support the United Nations Sustainable Development Goals

Founded in partnership with leading UK universities, CGI's SEEDS programme is developing innovative technology solutions, that are enabling stakeholders across organisations to access the tools and insights needed to achieve their sustainability ambitions.

Since launching in 2022, SEEDS has delivered a diverse range of research, proof-of-concepts and solutions. The programme now has over [20 member organisations](#), including Leicester University, Edinburgh Napier University, the United Nations Industrial Development Organisation (UNIDO), and Ordnance Survey. Together we are delivering a range of innovative technology solutions to address challenges and issues associated with climate change.



SEEDS projects

CGI DataTwin360 delivering sustainable IT Infrastructure management

According to many studies, IT infrastructure is trending towards 3% of total carbon emissions globally. This figure is estimated to grow to 15% by 2050 due to the growth of the industry.

Driving a net zero strategy and optimisation for your organisation is a complex data information challenge. It involves multiple stakeholders across the business with their differing day-to-day data requirements and priorities - all of which will need to work in concert towards this common goal.

CGI's DataTwin360 platform is a collaborative tool to support these kinds of organisational decisions. Our platform focuses on the assessment of the cost, energy use and carbon impact of IT infrastructure across your whole estate, using real-time IOT data to create actionable insights and support informed decision-making.

CGI DataTwin360 is a 3-dimensional, real-time visualisation data twin of your infrastructure. It is based on a Digital Twin Model using real-time data and analytics to create a simulation of your physical IT environments and its energy consumption. The system optimisation provides intuitive visualisations that clearly identifies inefficiencies in provisioned resources.

The platform can use machine learning to aggregate and translate the data to generate CO2 and energy ratings for each IT asset. The solution can also be used for Science-Based Targets, ISO 14001 reporting and is compliant with several other reporting obligations.

DataTwin360 leverages proven success. Applying CGI's tried and tested methodology, we reduced our data centre's Power Usage Effectiveness (PUE) from 1.64 to 1.21, resulting in a £150,000 annual energy cost reduction. Highlighting the negative economic impact of not running an optimised data centre.



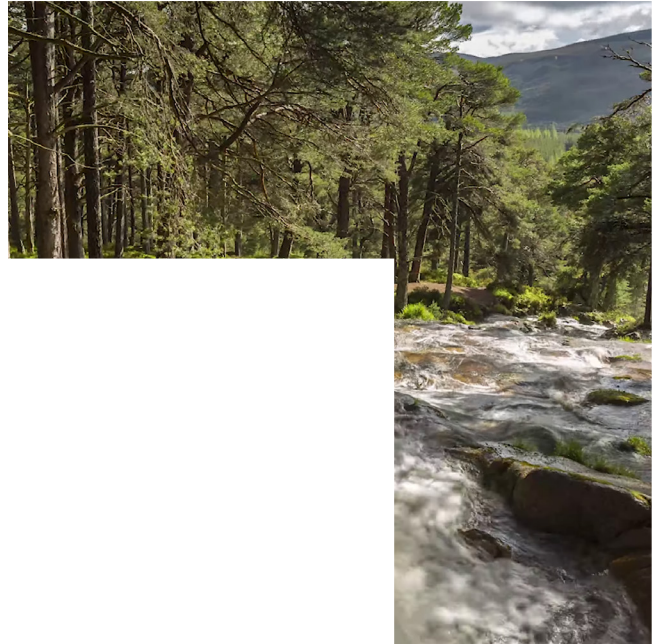
This win-win benefited our sustainability, IT, and facilities teams, while creating a direct positive impact for our clients. DataTwin360 provides virtual stakeholders with more comprehensive insights than physical site visits. This real-time, remote visibility provides the ability to effectively manage and monitor efficiency. If inefficiencies are identified, the tool provides mechanisms to closely monitor assets and provides steps to improve efficiency scores among other functionalities.

Alignment to the SDGs Goals:
9, 11, 12, 13 and 17



Hydro-energy assessment solution

At CGI we have developed a hydro-kinetic energy mapping application. The application built as a proof of concept can provide insights into the potential energy that a river system can produce, anywhere across the world, remotely. The solution is a web application built on Google cloud and can be accessed anywhere. Energy is a critical component of modern society, as it ensures quality of life, powers economies and ensure resilience. Decentralised sustainable energy can provide all these elements, but also empower the region to operate without the need to rely on aspects that are not within their direct control.



The solution is already providing insights in three developing countries in Africa but can be tailored and applied globally. The solution analyses hydrological geospatial data to interpret key aspects of a river system and provide reliable insight into the annual energy potential of the river.

This application has the potential to guide stakeholders with data driven insights to support strategic energy investment. By understanding a regions renewable energy potential, relevant stakeholders can invest with confidence in sustainable infrastructure to meet the needs of communities and future economic demands.

Alignment to the SDGs Goals:
3, 7, 8, 10 and 12



Virtual modelling for sustainable facility management



CGI and Edinburgh Napier University have developed an innovative digital twin technology that creates a virtual model of a building, allowing the simulation and analysis of that building's energy performance under a variety of conditions. By harnessing the power of this virtual representation, organisations can pinpoint areas of heat loss and identify potential insulation points. This unique solution can also be coupled as a sales solution. Allowing the construction sector to walk potential clients through the building and surrounding areas remotely. Enabling more effective communication through detailed 3-dimensional models.

Our digital twin technology enables organisations to optimise building operations, leading to substantial reductions in carbon emissions, as well as reducing economic loss in operations. We have developed this digital twin technology based on the Mountain Bike Centre of Scotland (MTBCOS). These actionable insights can help to enhance the building's sustainability and contribute to the Scottish Government's ambitious net-zero emissions target for 2045.

CGI's digital twin technology stands as a testament to CGI and our SEEDS partners unwavering commitment to tech for good. This innovative solution is paving the way for a greener future for the MTBCOS, empowering facility managers and architects across the UK to utilise technology to foster sustainable building management.

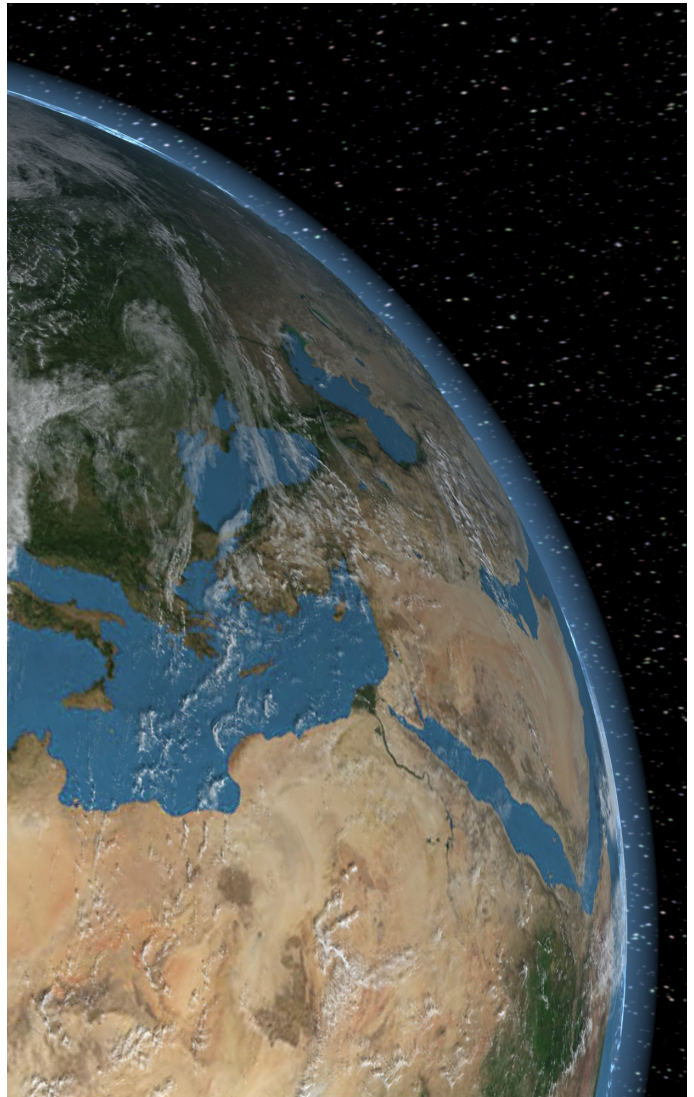
Alignment to the SDGs Goals:
9, 11, 13, and 17



A global methane mapping digital twin for emissions data

CGI and Edinburgh Napier University have partnered to demonstrate where innovation meets impact. Together, we developed a digital twin proof-of-concept to map methane emissions around the world, using the power of satellite technology and emissions data. This innovation allows 3-dimensional mapping to monitor and visualise the extent of methane emissions.

Methane, a potent greenhouse gas, is 28 times more impactful than carbon dioxide over a 100-year period. It is emitted from a variety of sources, such as oil and gas operations, landfills, and agriculture. This innovation is key to visualising methane emissions sources and demonstrating the true extent of what is being emitted. This POC provides a vital understanding of sources, quantities, and mitigation progress. This methane mapping visualisation identifies priority areas for targeted mitigation efforts.



Alignment to the SDGs Goals:
9, 12, 13, and 17



From insights to strategic action, CGI's AI water pollution prediction solution

CGI has developed a powerful artificial intelligence (AI) tool that can help organisations predict water pollution events, paving the way for a cleaner and healthier environment. This innovative solution accurately predicts point source pollution with 91.5% accuracy and non-point source (NPS) pollution with 73% accuracy, empowering proactive mitigation strategies, and safeguarding our waterways and supplies.

By analysing a vast array of datasets, from geospatial information to timeseries, the AI tool identifies areas conducive to pollution. By providing valuable and precise insights, the tool could enable key stakeholders, including water suppliers and farmers, to proactively mitigate the impact of pollution. By implementing mitigation measures over resilience, we can significantly reduce the risk of social and environmental damage such as dead zones.

Previously trialled in the North Devon UNESCO Biosphere Reserve, and working with several SEEDS partners (Ordinance Survey and WATR) CGI's AI Water Pollution Prediction tool is demonstrating its potential to transform water quality management practices. By providing actionable insights to local stakeholders, the solution will pave the way towards achieving the biosphere's, and other key stakeholders in the water sector's ambitious water quality targets.

This AI-driven approach marks a shift in water management practices, moving from reactive adaptation to proactive mitigation. Key stakeholders can understand where the pollution will occur, and then using statistical analysis, confidentially take measures to prevent the pollution from occurring in that location again. By empowering proactive pollution mitigation strategies, we are protecting biodiversity and public health.

Alignment to the SDGs Goals:
6, 14, and 17



Sustainable water management for groundwater monitoring

This project was commissioned by the United Nations Economic and Social Commission for Western Asia (UNESCWA). In the Arab region, where water is an increasingly precious resource, CGI is pioneering an innovation to inform water resource management. Leveraging satellite technology, CGI is analysing data sets that detect changes in the Earth's gravity monitor to groundwater levels across the region, providing invaluable insights into the volume of water available underground.

CGI's satellite-based approach detects groundwater levels across the region, revealing areas where water is rising or falling. This data will enable stakeholders to make informed decisions about resource use, optimise irrigation methods, and implement sustainable water management strategies.

By leveraging satellite-derived data to inform irrigation schedules, CGI is unlocking the potential to transform water resource management. These insights have the potential to facilitate mitigation actions to prevent dangerously low water levels.



This is critical as this region is one of the most water-scarce regions in the world, with 19 countries falling below the water scarcity threshold. This is further exacerbated by the transboundary nature of two-thirds of the region's water resources, which cross multiple borders and require collaborative and sustainable management.

Alignment to the SDGs Goals:
8, 9, and 13





Net Zero training for business continuity

CGI is developing digestible, gamified training for organisations navigating the challenges of achieving net zero. Net zero is a complex topic, but small and medium-sized businesses need to adapt to the net zero business model of the future. CGI's training is an avenue for businesses to decarbonise without the resources for significant investments in elaborate strategies.

Our engaging training, designed to motivate employees, requires no prior net zero knowledge. CGI recognises the power of gamification in retaining knowledge and boosting motivation. Step by step the training allows companies to conduct carbon accounting, craft a net zero roadmap, identify reduction levers, set Science-Based Targets (SBTs) and understand climate regulations among other benefits.

For small and medium-sized businesses net zero is a daunting unknown. CGI's Net Zero training will be an invaluable asset in the pursuit of decarbonisation. Governments and large businesses are driving net-

zero agendas, and businesses must align. Our training becomes the bridge, demystifying the complexities and providing an understanding of the strategic need for businesses to decarbonise for a seamless transition to net zero.

CGI's Net Zero training provides businesses with the tools to meet regulations and emerge as leaders in a sustainable and competitive future.

Alignment to the SDGs Goals:
4, 8, and 11



CGI's 'Planet Protectors' shaping tomorrow

As climate change looms, education becomes our most valuable tool. 'Planet Protectors' ensures that children, creators of the future, approach this challenge with hope and optimism.

At, CGI we have developed an educational game 'Planet Protectors' to encourage the younger generation to live more sustainably. This educational game is our call to action for the younger generation, inspiring a passion for sustainability in a fun and interactive way.

In 'Planet Protectors,' children embark on a journey through their everyday lives, where each decision holds environmental significance. The game illustrates the link between action and impact, empowering children to see the positive difference their choices can make. By actively engaging in sustainable decision-making, children learn to reduce their carbon footprint without inducing climate anxiety.

This isn't just a game; it's a tool shaping the future. As children become ambassadors for change, utilising their "pester power" to influence adults, 'Planet Protectors' becomes an invaluable asset. It equips the younger generation with the knowledge and skills needed to build a sustainable tomorrow.



Alignment to the SDGs Goals:
3, 4, 11, and 17



Tech-infused healing to redefine stroke rehabilitation

CGI and Edinburgh Napier University collaborated on an innovative virtual reality (VR) therapy to enhance stroke rehabilitation, building on traditional mirror therapy. Annually, 111,000 individuals in England, 11,000 in Wales, and 4,000 in Northern Ireland experience strokes, with 900,000 people living with the impacts of post stroke. Leading to mobility restrictions and lasting challenges.

This dynamic solution keeps patients engaged and motivated to improve adherence to rehabilitation programmes, boosting patient outcomes.

This interactive VR solution serves as a modern iteration of mirror therapy, tracking patient progress and offering a range of settings. Traditional mirror therapy involves placing a mirror at the midline of a patient's body with the affected limb out of view. Patients then perform movements with the unaffected limb. This then tricks the brain into perceiving the affected limb moving.



This then assists the restoration of the damaged neurons in the brain, to relearn the ability to move the damaged limb. The VR innovation elevates this method, adding a tech dimension to rehabilitation programmes. Enabling remote monitoring of the patients progress and immersing them in a world of their choice. Taking patients virtually out of a hospital.

Our VR game increases engagement in rehabilitation and can be seamlessly incorporated into rehabilitation programmes. This innovation serves as an interactive and progress-tracked tool.

Alignment to the SDGs Goals:
3, 4, and 17



Ride with confidence with CGI's Mountain Bike Route Assessment App

Navigating the complexities of mountain bike route safely can be complex, particularly for new riders. Factors including weather conditions, air quality, internet connectivity, and the presence of other riders can significantly impact user safety.

This new Mountain Bike Route Assessment App, developed by CGI and Edinburgh Napier University aims to transform the sport by prioritising the rider experience. Utilising satellite technology and real-time data, the App will enable mountain bikers of all skill levels to make informed route decisions, optimising their experience and minimising risk.

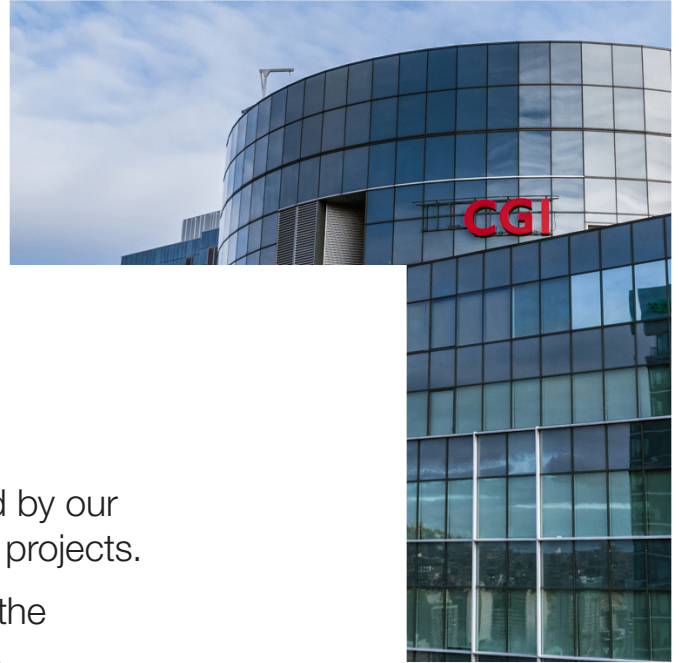
By leveraging satellite technology and comprehensive data sets, the app identifies potential hazards, ensuring riders plan their route based on a holistic view of trail conditions. It integrates features of a typical health and activity app, complemented by real-time safety updates.

The app's data-driven insights empower riders to make informed route choices, enhancing safety, boosting confidence, and accelerating skill development.

The Mountain Bike Route Assessment app is a game-changer for mountain bikers of all levels. By harnessing technology, the app makes the sport safer and more enjoyable for everyone.

Alignment to the SDGs Goals:
3, 11, and 17





From the seabed to space, CGI is trusted by our clients to deliver complex mission-critical projects.

We understand the impact of society on the environment and work with organisations, communities and economies to leverage IT for good, supporting the transition to net zero.

We are proud of being a responsible business, committed to a more inclusive and sustainable world, for future generations.



Scan QR-code

For more information
about the SEEDS
programme



About CGI

Insights you can act on

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-based to help accelerate returns on your investments. Across hundreds of locations worldwide, we provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

cgi.com/uk/SEEDS

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