Impact Objectives

- Develop a strong and innovative user-driven framework to promote, improve and develop the use of Earth Observation data
- Demonstrate at scale the potential of the project through cloud-based Pilots to support adoption of the methodologies, concepts and approaches by the Earth Observation community
- Create high technical and added-value businesses and jobs in Europe

Shaping our understanding of planet Earth

***Professor T Ranchin, Dr N Fichaux, Lionel Menard** and **Mathieu Reboul** work together on the **e-shape** project, which seeks to promote, improve and develop the use of Earth Observation data to improve global sustainability and resilience*

Professor T Ranchin

Dr N Fichaux

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What role do researchers, SMEs and companies involved in Earth Observation (EO)-based services play in the e-shape initiative?

NF: Developing EO-based services is a long process that involves all the actors within the value chain. Starting from the need, moving onto the idea, following the research and development process, prototyping, developing the business case, commercialising the service and making it available on the long run. This process needs the support of many actors – and first of all the users. To achieve the ambitions of e-shape, a consortium of 55 partners have come together to develop 27 pilot applications across seven thematic areas: agriculture, health, renewable energy, ecosystem, water, disasters and climate.
In e-shape, the Pilot Teams collaborate in different ways to bring together their skills and competences in a way that benefits the project as a whole. The array of expertise available through the consortium brings diversity and a cross-fertilisation of knowledge.

How important are your collaborators to the delivery of this initiative?

LM: The e-shape project is a unique blend of talents. It is a team working together for the benefits of the EO community and to meet the needs of the users. Through collaboration we have built a flagship project that will positively impact the majority of the EO community. This engagement is supported by thematic 'champions' and there are various partners who contribute to showcasing the project's achievements - partners who have been in the EO domain for a long time. To support our aims, we have selected world-class Work Package Leaders who specialise in areas such as data and cloud computing, co-design, capacity building, sustainability, upscaling, communication, dissemination and ethics. All partners within e-shape are committed to the project and the individual networks come together to create one that serves the EO community.

What role do the Pilots play in the project?

LM: All Pilots are a legacy of previous projects and are committed to success. The project started in May 2019 and we are in a phase where the first successes are being realised. For example, the recent announcement of the European Green Deal, renewable energy is vital to the energy transition in Europe. The technical challenge lies in integrating and distributing a large share of variable renewable sources – such as from large solar arrays. What we want to achieve is to help make applications a success for the benefit of end-users.

What will you be focusing on in the coming months and years?

TR: The first year was really challenging. Even though we had known all the partners for a long time, building the spirit of e-shape, shaping collaborations, organising activities and participating in the community was a huge task. I think we succeeded in this and created hopes and expectations within the wider EO community. In the coming year, we are going to make the first Pilots available to the whole community and are working on a series of challenges to help develop the Pilots themselves. This coming year will be the occasion to confirm the unique value of e-shape and its full support to the EO community in Europe and beyond.

e-shape: a cloud-based contribution to Earth Observation

__e-shape__ is a unique initiative under the EU-funded __Horizon 2020__ programme that seeks to accelerate a breakthrough in the European Earth Observation sector. The project will support a coordinated exploitation of data and services across the sector and be of benefit to industry, science, decision makers and members of the public in Europe and beyond

Earth Observation (EO) is the collecting, analysing and presentation of information related to the Earth to improve understanding of our planet. The data that is gathered is usually centered on physical, chemical and biological systems that help researchers identify and understand changes in the natural and human-made environment. Observing Earth from a vantage point in and around space - often through satellites - enables scientists to access a bird's eye view of the planet, providing a unique perspective on a wide range of subjects, such as extreme weather events and their effect on the environment. Improved observations have come together with the explosion of modelling and cloud computing, which helps make better, and more sustainable, decisions.

As technological capabilities have increased, so too has the focus on EO. Countries around the world are developing means of observing the Earth in an attempt to reap the related rewards, such as improved understanding, but also the creation of jobs and the achievement of various goals highlighted within international organisations, such as the United Nations' Sustainable Development Goals (SDG). Indeed, the potential positive outcomes from sustained EO can hardly be overstated, as it permeates through into an extremely broad range of different areas that will touch and impact humans around the world either now or in the future.

It is with the above in mind that e-shape has been established. This is a flagship project of the European Commission that falls under the Horizon 2020 programme. It is a unique initiative that brings decades of public investment in EO and cloud capabilities together to form a range of services for decision-makers, members of the public, industry and researchers. With 55 partners from 17 countries, this project has far-reaching impacts.

A UNIQUE APPROACH

Professor Thierry Ranchin, based at MINES-ParisTech/ ARMINES within the Paris Sciences and Lettres Research University, is the Project Coordinator, with support from Lionel Ménard, Mathieu Reboul and Dr Nicolas Fichaux who are on the project management team. Ranchin emphasises the importance and uniqueness of this particular initiative. 'Several European projects have explored research and development actions to reach similar aims to

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e-shape, but what makes this project unique is that a complete approach will be applied, developing all the different tools and methods that will enable upscaling of the EO application industry in Europe,' he highlights. 'We believe that demonstrating the potential of our work at scale is key for adoption of the methodologies, concepts and approaches by the EO community, so the consortium's Societal Benefit Areas are aligned with concerns addressed by the UN's SDGs, the Group for Earth Observation (GEO) and its European version EuroGEO.'

Throughout the duration of this four-year project, the consortium will work to confirm its findings and improve its approaches and, to achieve this, an onboarding process has been established. This process will allow teams to propose new Pilots. Five Pilots will be selected this year and five more in 2021, with funding being allocated to assist with these specific contributions. GEO has three main priorities - SDG's, the Paris Agreement and the Sendaï Framework - and e-shape is committed to supporting these priorities through its activities. Indeed, the thematic areas are all related to specific SDGs, while the climate and renewable energy, and disasters areas are designed to contribute to the Paris Agreement and Sendaï Framework respectively.

SEVEN THEMATIC RECIPES FOR SUCCESS

There are seven thematic areas within e-shape (agriculture, health, renewable energy, ecosystem, water, disasters and climate) and the team is in the process of developing a number of cloud-based Pilot applications that are on the way to being completed. These applications help foster entrepreneurship and address societal challenges in many ways. 'As the volume of EO data and the computing needs have dramatically increased during the last decade, developing EO-based services evolves hand-in-hand with the capabilities of cloud-based services,' observes Ménard. 'The development of the computing facilities within Europe offers a new ecosystem where the developers of EO-based applications need guidance.'

The list of possible resources within Europe is exhaustive, including the Data and Information Access Services (DIAS), the European Open Science Cloud, the Thematic Exploitation Platform (TEP) of the European Space Agency, the Data Cubes approaches, the NextGEOSS dataHub and the GEO platform, so initiatives like e-shape become even more important; they help the community navigate the options in efficient and effective ways.

The team is exploring both public and private markets of EO-based applications with a view to establishing sustainable business activity. To achieve this, part of the project focuses on the sustainability and uptake of EO-based Pilots and will pursue this through the development and use of a Sustainability Support Package, which is a suite of support actions delivered to Pilot teams. These teams will therefore be equipped with tools to develop robust business plans or sustainability strategies for their application.

GUIDING THE EUROPEAN EO COMMUNITY

By way of example, one of the e-shape Pilots is 'Monitoring Fishing Activity' which is aligned with the Common Fishery Policy. 'Reconciling food security with the sustainable use of biotic renewable resources, including marine resources, while ensuring environmental protection is a major challenge,' explains Fichaux. 'As such, our Monitoring Fishing Activity Pilot supports the monitoring responsibilities of the Portuguese fishing management institutions by characterising the activities of the tuna and swordfish fishing fleet in the Portuguese Exclusive Economic Zone.'

These Pilots would not be possible were it not for the research partners, who are often the ones that bring the original idea to an initial prototype. They develop and adapt the services in partnership with users, SMEs and other companies who are most often the ones ready to continue developing the ideas to bring them to market. 'This close alignment with industry is absolutely essential to the success of the project as it turns ideas into concrete realities, by combining skills, competences and a practical need for the realisation of an idea,' confirms Ranchin. The innovations that are driven by these collaborations are vital to all parties.

Ultimately, e-shape is not simply another EU project - the chief aim is to create and foster strategic knowledge that can be shared across the European EO community. By involving companies, researchers, decision makers and members of the public every step of the way, the community hopes that e-shape will be the lighthouse that guides the European EO ecosystem to success.

Project Insights

FUNDING

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e-shape CONSORTIUM

There are 55 partners from 17 countries and beyond - https://e-shape.eu/index.php/team

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EuroGEO Showcases. Applications Powered by Europe

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