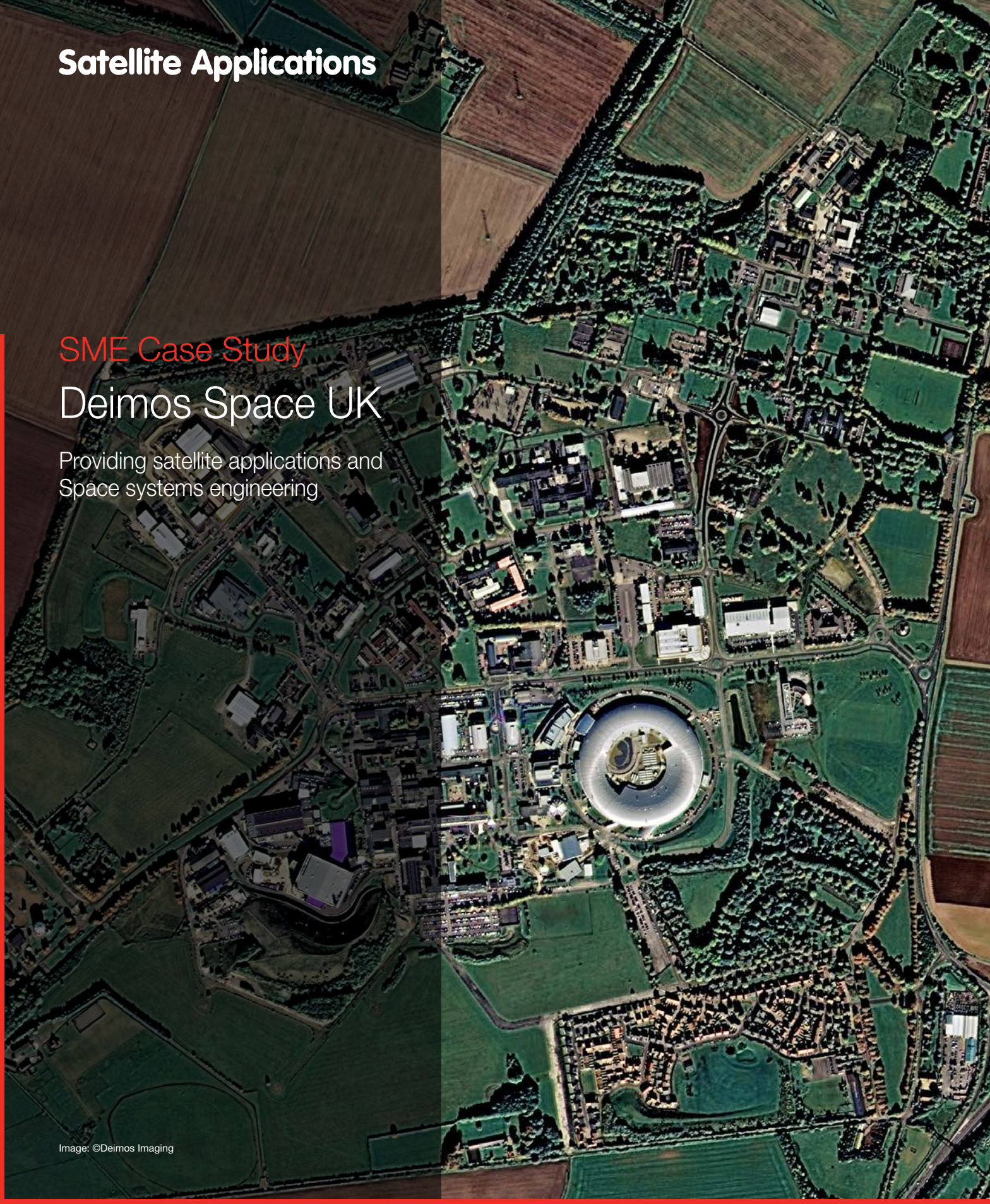
Satellite Applications

SME Case Study

Deimos Space UK

Providing satellite applications and Space systems engineering



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CATAPULT

The Company

Company Name	Deimos Space UK Ltd
Managing Director	Philip Davies
No. of Employees	18
Launched	2013
Location	Harwell, Oxfordshire
Sector	Space systems, services and applications

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Deimos has a broad research and development portfolio, including precision farming, smart cities and offshore applications.

Deimos set up its UK office in 2013 – it was the obvious choice for the company with the growing UK Space sector.

Overview

Deimos Space UK is a subsidiary of Spanish firm Elecnor Deimos, itself part of the large industrial group Elecnor. Launched in 2013, its business is split between satellite applications and Space systems engineering, which encompasses flight systems, ground segment and global navigation satellite systems (GNSS).

- Supported in establishing its UK business by UK Trade & Investment (UKTI), the Satellite Applications Catapult and the UK Space Agency.
- Has a broad research and development portfolio in diverse satellite applications markets including precision farming, smart cities and location-based services for onshore and offshore applications.
- Working on commercial contracts and projects funded by the UK Space Agency, Innovate UK and the European Space Agency, both within and outside Europe.

From Ground Stations to Satellites and Back

The expanding Harwell Campus

Elecnor Deimos has a long heritage in satellite and Space-related engineering in Spain. When considering where to open its third subsidiary in Europe (after Portugal and Romania) back in 2013, the UK seemed an obvious choice given the momentum that was building across the country. The company had noted the growing market in the UK for Space systems and services and for the development of new applications, and was attracted by the opportunities to collaborate with local companies. In addition, Elecnor Deimos has been involved in the majority of European Space Agency (ESA) programmes since its creation in 2001, so having a UK base would make it easier to work with UK companies working on ESA projects. It was keen to develop links with the UK's very strong research base and exploit the work going on in universities and research institutes.

The company quickly identified Harwell as an ideal location because of the growing cluster of Space sector companies based there and the local support available from the Satellite Applications Catapult and the Science and Technology Facilities Council (STFC), both based in the Harwell campus. Thus Deimos Space UK was established with its first employee in November 2013.

Deimos's initial work in the UK focussed on ground segment software and satellite flight systems, building on its parent company's success. In flight systems, activity can focus

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on everything from planning a satellite mission to software used to control a satellite in orbit and manage its guidance, navigation and control systems. In ground segment, work involves processing the data delivered from Earth observation (EO) satellites, including image processing, archival systems and data calibration.

The company has a full suite of ground segment software products that has evolved through its work for ESA and from operating its own satellites (which are now owned by UrtheCast). Its gs4EO® ground segment products are either supplied as a complete suite or as individual modules.

In late 2014, Deimos expanded its downstream business in the satellite applications market by taking on the R&D projects and staff of Magellium Ltd.

Deimos has worked directly with the Catapult on the Sentinel Data Access (SEDAS) project.

The Right Data at the Right Price

Deimos has worked directly with the Catapult on the Sentinel Data Access (SEDAS) project, which will support the UK Space Agency's UK Collaborative Ground Segment by making datasets from ESA's Sentinel satellites, along with other data and related information, easily available to UK academic, public and private sector users. Deimos's archive4EO module provides the archiving mechanism for SEDAS, enabling access to a 30-day rolling archive which is held on the Catapult's Climate, Environment and Monitoring from Space (CEMS) facility at Harwell, along with a complete metadata set for the entire mission.

In another project – Knowledge, Observations, Response, Evaluation (KORE), which is co-funded by ESA under its ARTES 20 (Integrated Applications Promotion, IAP) programme – Deimos is creating a platform to integrate optical and synthetic aperture radar (SAR) data plus data from unmanned aerial vehicles (UAVs) with data from soil measurements or sensors on tractors. The aim is to enhance an existing precision farming service offered by UK agronomy firm Soil Essentials, allowing farmers to deliver varying amounts of fertilisers and pesticides with extreme accuracy across every field based not only on variations in soil type and condition, but also on crop health.

Although other firms are working on similar precision farming projects, Michael Lawrence, Deimos UK's Business Development Director, explains that the difference here is the combination of diverse types of satellite data plus data from drones – whose positions are themselves tracked by GNSS satellites – along with the development of a low-cost way of processing and presenting the data. "There are both technical and business challenges, which is why we have got funding from ESA for a demonstration," he adds. "Even when we crack the technical problems, we have to be able to do this at minimum cost."

In an ESA IAP project, Deimos is currently investigating applying positioning, EO and comms data for building offshore structures, such as wind farms.

The Future

In another ESA-funded IAP project, SUMO (Support to Marine Operations in Offshore Wind Farms), Deimos is investigating applying positioning and EO data, along with satellite communications, to provide a logistics management service for building and monitoring offshore structures, such as wind farms. Scottish Power Renewables has acted as the reference customer for SUMO, which could bring large savings by integrating a diverse range of information on metoceanic conditions and locations of vessels and people.

Deimos is also receiving external funding for a smart cities project in Dubai – this time from the UK Space Agency (see Case Study). Again, the project's success will depend on using the right kind of satellite data, processed efficiently, to achieve the desired goals. In Dubai, with its minimal cloud cover, optical data is sufficient, but if this project proves successful, Deimos will turn to other sources, such as SAR, in order to offer a smart cities solution in less sunny climes.

The company's other plans for the future in the UK include building on the success in Spain of its Alhambra railway passenger information system and its Kyros location-based services platform. Alhambra was developed for Spain under ESA's Technology Transfer Programme and Deimos is now looking at potential applications in the UK. Kyros, meanwhile, uses Galileo, GPS and other location technologies to track and analyse positions of people, vehicles or objects (carrying appropriate devices). The system has myriad diverse applications, including fleet management, remote health monitoring and supervising lone workers in remote locations. Deimos has already forged a partnership with UK-based Oysta Technology to focus on the health monitoring market.

For a company which has only had a UK base for such a short time, Deimos has made its mark very quickly. “We’re really grateful to UKTI, the Catapult, Innovate UK and the UK Space Agency for their help since we launched here,” acknowledges Managing Director Philip Davies. “We joined this sector in the UK at an exciting time, but the support of these organisations is key for all our growth plans.”

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Case Study:

Infrastructure Change Monitoring

EO data detecting changes in road networks and buildings

Dubai has one of the fastest growing economies in the world, but with that comes enormous environmental, economic and industrial changes. Such changes can be hard to track, so Deimos has been working since May 2015 with Dubai’s Mohammed Bin Rashid Space Centre (MBRSC) on a project using EO data to monitor and detect changes in road networks and buildings, as well as variations in vegetation and water, in support of the Dubai government’s ‘smart government’ initiative.

The 12-month project, known as SAFIY (Smart Application for Feature extraction and 3D modelling using high resolution satellite Imagery), is being co-funded by MBRSC and the UK Space Agency’s International Partnership Space Programme, and is due for completion in April 2016.

SAFIY’s mapping applications will use high resolution optical data from two satellites – DubaiSat-2 and Deimos-2 – to support government agencies with planning and with maintaining a sustainable city as it continues to grow. “Two satellites means that we can build a dataset very quickly, which we will use in an automated system to provide updated maps as new roads or buildings are created, or there are changes in water or vegetation,” says Michael. “This will let us provide cheap yet high quality information fast as part of a city-based system.” This will include innovative 3D modelling using stereo images, allowing any increases in the heights of buildings to be monitored as well as changes in footprint, reflecting the particular needs of a city like Dubai.

Catapult Support

“Our relationship with the Catapult is very good and works both ways,” explains Michael. “We attend workshops where they are evaluating new business areas, such as agriculture and smart cities. These events help us to identify new business opportunities and see where market opportunities are evolving. The Catapult helps us understand what customers’ needs are now and what they are likely to be in future.”

“We’ve also worked on a number of projects with the Catapult, either as a contractor or a partner, such as SEDAS. And we’ve done some work with them in Chile and Milton Keynes, where they were looking for specific ground segment processing expertise that we could provide quickly.”

“We try to give something back too. I’m the chair of the Advisory Board of the Catapult’s Regional Centres of Excellences and we support Catapult events to provide case studies, give presentations and meet VIPs. I’m also a big advocate of their SpIN intern programme.”

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