

DX of space systems through the establishment of a mass-production model of multipurpose 6U nanosatellites

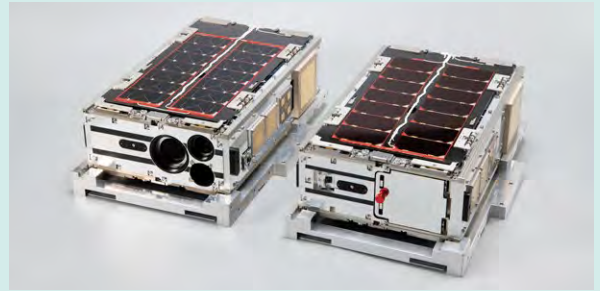
ArkEdge Space Inc.

The University of Tokyo, Nakasuka, Funase, and Ikari Laboratory

Seiren Co., Ltd.

Case Overview

ArkEdge Space has achieved semi-mass production of a versatile and general-purpose 6U nanosatellite model, including advanced applications developed by the University of Tokyo, and built a technological foundation (Aegs, Ocea, and ArkEdge Insights®) that integrates satellite development, operation, and utilization with standard IT technologies. This enabled high-mix, low-volume production using a highly reliable bus system and rapid mission demonstration. This system facilitates participation by non-space industries and contributes to the expansion of the overall space industry, while also creating a data utilization market that helps address diverse social issues.



General-purpose 6U nanosatellites with multiple on-orbit demonstrations underway

Key points regarding receiving the award [Comments from the selection committee]

It is highly commendable that, by establishing a mass production model through linking the development, operation, and utilization of nanosatellites with standard IT technologies, this initiative encourages participation by those with limited space experience and is expected to support wider adoption in the future.

It is also highly commendable that this digital transformation of space systems through a mass production model for multi-purpose 6U nanosatellites has already been put into practice, with mass production underway and deployment advancing in Japan and overseas across diverse fields.

Concrete Results

1. Contribution to creating new areas for space development and utilization

Based on the research results of the University of Tokyo, ArkEdge Space has established an integrated system that provides a comprehensive range of services from satellite bus system development (Ocea) to ground station operation (Aegs) and data services (ArkEdge Insights), enabling high-mix, low-volume production of 6U nanosatellites. To date, the company has conducted in-orbit demonstrations of 11 6U satellites, including those based on the University of Tokyo research, and has a track record of operating and providing data for 17 satellites. Furthermore, it has developed semi-mass production technologies in collaboration with Seiren Co., Ltd., achieving a development and operation cadence of two satellites per quarter. A full-scale mass production system capable of further scaling is now in place.

Through these efforts, it has successfully demonstrated a wide range of advanced missions on orbit, including global AIS data acquisition, hyperspectral imaging, and IoT communications.

2. Contribution to expanding the space development and utilization market

In the one-year period through November 2025, the company launched and began operating nine 6U satellites, a record high for any Japanese institution or organization (according to the company's research), and successfully carried out a variety of missions. Currently, around 30 commissioned contracts and subsidized projects have been secured toward the realization of a constellation, and memoranda of understanding and other agreements have been concluded with more than 10 countries and organizations. In the future, the company has the capacity to expand to a scale of 100 satellites in response to demand, with the potential to significantly expand Japan's space market.

In the field of data utilization, the integrated platform "ArkEdge Insights" has begun pilot implementation not only with municipalities in Japan but also in Brazil and Fiji, and is being put into practical use as a government system in Paraguay. The company is also advancing collaboration with African countries, significantly strengthening its presence in the global market.

In addition, by involving automotive parts manufacturers and equipment manufacturers, as well as conducting on-orbit demonstrations of components made by Japanese startups, the initiative is creating opportunities for non-space industries to enter the market and helping broaden the base of the space market.

3. Contribution to the advancement of the economy and society

In the field of observation, the initiative is advancing environmental monitoring using hyperspectral satellites and building the foundation for marine digital transformation through global AIS data. IoT satellites have successfully collected data in areas where ground infrastructure is underdeveloped, contributing to bridging the digital divide and promoting international cooperation. "ArkEdge Insights" has established a freemium model that integrates proprietary data with AI processing technologies and open data. By providing affordable means of using space data to non-space industries and developing countries, including for agricultural and water resource management in Paraguay, it is contributing to advancement across multiple fields and to the achievement of the SDGs.

4. Contribution to technology

CubeSat technology was advanced to establish a highly reliable "6U general-purpose bus system." Complex missions such as large antenna deployment and hyperspectral imaging were achieved in a 6U size, dramatically expanding the potential of nanosatellites. A proprietary software suite (Aegs and Ocea), together with an open design, established a technological foundation that enables rapid participation from non-space fields. Furthermore, "ArkEdge Insights" integrates AI super-resolution and ground-based data. Verification using IoT data also contributes to improving the reliability of digital twins (measures against hallucinations). These technologies, backed by 10 patents, are accelerating industrial applications.

5. Contribution to promoting public understanding and human resource development

Through close collaboration with the University of Tokyo, the initiative established an industry-academia collaboration model that rapidly translates cutting-edge research into industrial applications. It also established an "open development system" that allows IT and non-space companies to participate at low cost, thereby expanding the scope of space utilization and contributing to the development of engineers who can immediately contribute. In addition, the nanosatellite YODAKA carried out a Tanka mission with high school students. Through a demonstration of transmitting and receiving Tanka in segments, the initiative established IoT communication technology that could also be useful during disasters. This initiative, which combines culture and technology, also has an educational effect of conveying the appeal of space development to the next generation. It presented a new form of space utilization that combines technology demonstration with next-generation human resource development.

