IAF SPACE SYSTEMS SYMPOSIUM (D1)
Innovative and Visionary Space Systems (1)

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WHAT'S NEXT AFTER INDUSTRY DISRUPTION BY CUBESATS? – INDUSTRY DISRUPTION BY OPEN SOURCE.

Abstract

Less than a decade ago, CubeSat mission architectures featured almost exclusively in the academic domain only. The same can be said today about the for innovation and transformational potential of Open Source satellites.

In the same way that CubeSats and the associated development mindset started in the academic community and are now being embraced by commercial, civil and defence communities worldwide, the goal of the Open Source Satellite Programme is to stimulate and enable a similar paradigm shift and outcomes for Open Source space systems and mission architectures, by developing a novel design that is freely available for the use and involvement of people throughout the space ecosystem to develop new missions, applications and services.

The team's goal is to build a global community of Open Source contributors, collaborators and beneficiaries, including those from CubeSat and SmallSat teams who are at the forefront of adopting and championing non-traditional approaches to delivering space missions.

A key characteristic of Open Source projects is the engagement of stakeholders – to provide requirements and use cases, to collaborate to iterate and improve elements of the architecture and design - and ultimately, to be able to leverage and benefit from the design outputs.

The Open Source Satellite Programme is developing a robust, flexible low cost 20kg-250kg satellite platform which addresses future market, mission and programmatic demands, leverages emerging technologies and is scalable from NanoSat to MicroSatellite systems, enabling teams to treat the platform as a low cost "commodity" or infrastructure item on which to develop their specific mission. Importantly, the aim is to implement step-change - not incremental - innovations to deliver an order-of-magnitude improvement in price:performance.

This Paper will discuss: •The target Open Source Satellite Platform initial capabilities and technical roadmap for future mission capability enhancements •The "Clean-Sheet" design methodologies that are being implemented to define the system and mission architecture •The application of an Open Source development approach for systems in the Space domain •The types of missions, applications and services that could be enabled with the design; from LEO to interplanetary missions •The opportunities that are available for teams to get involved in and benefit from the Open Source Satellite Programme.