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ANALYSIS OF A "MULTI-CUSTOMER SATELLITE ACCESS" (MUSA) APPROACH

Abstract

In the last couple of decades, Small Satellites were generally launched as auxiliary payloads to "more important" missions, often demonstrating low reliability and poor performance. Those two limitations are linked to the fact that Small Satellites were usually developed in the frame of a low cost approach that favored the use of Commercial-Off-The-Shelf (COTS) components, not always qualified for space flight.

Nowadays an innovative mission approach, that relies on the simultaneous adoption of three key concepts, namely the use of Small Satellites, the preference for High Technology, and the availability of Air-Launch Systems, can be proposed. To consider all the previous three characteristics at once leads to a commercially effective approach that can solve current existing needs, eventually producing a profit for satellite operators.

The present study reports a preliminary analysis of the mission named "Multi-customer Satellite Access" (MuSA), that involves a formation of remote sensing Small Satellites, with High Tech optical payload, placed on the most suitable orbit via an Air-Launch System, which are able to gather data and distribute it among a well-defined group of customers that, for inability or unavailability of resources, decides to share the ownership and control of the satellite formation.

The MuSA project can be considered of commercial interest for those companies interested in entering the small satellite market, and of political interest for those governmental institutions interested in gaining quick access to space and in making effective use of the satellite services, without having to set up a national space agency (mostly envisioned by developing countries). Following along the above concepts, a case study that only considers developing countries (as customers) is performed.

The MuSA approach is meant to be flexible, low-cost, and reliable. It was created to serve several needs: to support developing countries in gaining access to space, to boost the role of Small Satellites in the space industry, to accelerate the standardization process of space components, to multiply the opportunities to perform In-Orbit Demonstrations, to offer rationales in developing Air-Launch Systems, and to eventually support Tactical Needs.