

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Launch Services, Missions, Operations, and Facilities (2)

Author: Mr. Raju K
AgniKul Cosmos, India, raju@agnikul.in

Mr. Srinath Ravichandran
AgniKul Cosmos, India, srinath@agnikul.in

Mr. Syed Peer Mohamed Shah Khadri
AgniKul Cosmos, India, moin@agnikul.in

BLOCKCHAIN FOR ON-DEMAND SMALL LAUNCH VEHICLE SUPPLY CHAIN

Abstract

We seek to examine and demonstrate how to develop a low cost, on-demand small launch vehicle that strategically leverages local and international supply chain instead of a fully vertically integrated model that is in vogue in new space launch vehicle companies. This paper would talk about global strategic footprint that is required for supply chain, manufacturing / assembly, vehicle integration and launch pad to achieve cost efficiency and to meet time-to-market needs of current and future launch demand for nanosatellites and microsatellites. The study will showcase key initiatives such as lean flow of parts/components in the chain, warehousing techniques and additive manufacturing that is required to offer on-demand production and launch from cost effective locations for different orbits. Analysis will focus on how Blockchain could help realize benefits in small launch vehicle manufacturing supply chain through cost efficiency. We propose a framework for blockchain application to improve supply chain performance and competitiveness. Smart contracts on the blockchain, in conjunction with internet of things (IoT) would improve supply chain visibility, build agility, develop collaborative relationships with suppliers and customers, build trust and reduce time to market across the value chain. we delve upon improving engineering-manufacturing integration, asset availability and service contract profitability by creating digital thread that captures asset configuration from initial design through in-service. we would elaborate on how Blockchains provide strong process step and data element controls, and capture immutable data, which supports network control and auditability. We also outline considerations for risk mitigation and continuous delivery of high level of customer service. Based on detailed analysis of global demand, existing supply chain and need for sustainable business model, we conclude on why and how an on-demand small launch vehicle can competitively leverage international supply chain and develop a cost-effective, agile adaptive framework to align with interests of all operators involved in the supply chain.