Paper ID: 84055
oral
student

37th IAA SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS (E3)
The future of space exploration and innovation (2)

Author: Dr. Alessandro Paravano
Politecnico di Milano, Italy

Prof. Giorgio Locatelli
Politecnico di Milano, Italy
Prof. Paolo Trucco
Politecnico di Milano, Italy

ASSESSING THE REVENUE STREAMS OF COMMERCIAL SPACE STATIONS: A VALUE NETWORK APPROACH

Abstract

Over the past two decades, the space community has been diligently exploring avenues to unlock and maximise the value of the International Space Station. This extraordinary orbiting laboratory has empowered researchers globally to harness the benefits of microgravity and exposure to space. While the journey has presented challenges, there is an optimistic outlook for further discoveries and innovations that could significantly enhance the economic, environmental, and social value of space stations. With this aim, NASA launched the Commercial LEO Development Program to encourage established and new private actors to design commercial space stations (CSS) that could replace the ISS by 2030.

Yet, to be economically sustainable, CSS have to be valuable for new end customers willing to pay for the products and services exploited on board. Therefore, private and public CSS providers urge to identify a priori the scope, the customers, and the most promising revenue streams of CSS.

This paper aims to unveil and map the potential revenue streams of CSS and to assess the most valuable according to the different architectural designs and possible products and services provided. To this end, we perform a value network analysis of the commercial space stations, mapping the value flows among space organisations and their (potential) customers. We provide a value network map of the commercial space stations, clarifying the most promising revenue streams. The analysis is based on primary data and secondary data collected from CSS providers and actual and potential customers, and the value network analysis, rooted in the well-established systems architecting body of knowledge, offers a quantitative method to assess the value of CSS.

Our findings offer a complementary perspective to CSS providers, presenting user perspectives to aid in the development of compelling value propositions. By shedding light on the most promising revenue streams in the short and long term, our insights guide CSS providers in designing space stations that align closely with clear and specific user expectations. This involves implementing an integrated as-a-service supply chain and exercising tight cost control, potentially achieved through minimising or circumventing human involvement in CSS operations. By understanding user preferences and concerns, we contribute positively to reflect on the CSS trends and market development.