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A "HANDS ON" MULTIDISCIPLINARY CRASH COURSE BASED ON A SIMULATION MODEL FOR A "DESIGN TO COST" MULTITASK MICROSATELLITE SYSTEM TO BE BUILT AND OPERATED ON A PROJECT FINANCING BASIS - THE SEA-LIKE HORIZON SPACE TUTOR (SHST)

Abstract

The Space Community within ASI's (Italian Space Agency) "Distretto Virtuale" (D.V.), a Homepage information exchange platform (technological mapping, socio-economic trends, etc.), is traditionally engaged in education, involving Universities, in the Space economy domains. As already described at IACs (2017 E1.3), this is mainly based on University teachers and students' access to the DataBase, to elaborate, with ASI's assistance, its datasets on studies for their Graduate or PhD Space Economy thesis' (sectoral trends, public and private market shares, etc.). Lately, more complex technological analysis was added: space debris risk assessment, small satellites constellations' uses in land and sea emergency management, etc. The latter deserves mentioning as it produced lectures for students, i.e. at University of Rome2 within its SICC Conferences and related CBRNe (management of dangerous events) international Master.

This hybrid (technical and economic) Space Economy knowledge is now aimed at a new educational "product", for the technical and economical configuration of multitask (communication, imaging and navigation) microsatellite systems, in the form of fully private "project financing" schemes, offering a better balanced, and environmentally sustainable, planning, to compare with the classic one (Starlink, Huawei, etc.) consisting instead of corporate investments in massive constellations. This "alternative" structure should be agreed step by step with potential investors, and sized to the expected lifetime market turnover, which is the "core" guarantee (from certified long term purchase agreements) according to project financing rules, ensuring necessary return to equity and financial engagement. This entails system's smaller dimensions and environmental sustainability, along with the use of a "design to cost" method, where a starting configuration is reiteratedly versioned, adapting to varied cost coverages, in turn influenced by the actual market potential response.

The SHST model, therefore, apart from being actually under business discussion for services over the Atlantic longitudes, (2017-2022 E3.1/3 IAC's Symposia), is also a "per se" complex and practical educational tool, especially for basic training (also non academical) - i.e. in Developing Countries lacking in "readiness" for these crucial services; it offers "in a nutshell" a dynamic, hands-on, overview of all the domains involved: national and law, technical flight and ground structure, its operation, its cost matching and financing aspects, potential users, marketing. The Module's structure is in 3 phases (2-3 days); a) preliminary technologic briefing, b) preliminary legal and economic briefing c) analysis of project financing cash flow with an assigned "task" on one of the project's issues, consistent with the student's professional area.