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MISSION CONTROL AS A SERVICE - A TURN KEY SOLUTION IN SPACE COMMUNICATIONS

Abstract

A crucial part of space missions is efficient and reliable mission control – a set of tools and activities to control and monitor the progress from the point of launch until landing or the end of the mission. It is part of the ground segment of spacecraft operations.

The main customer pain point for mission operators is that today there is no whole solution for mission control combining crucial parts of a successful space mission: mission control system (MCS), radio communication coverage, support and satellite control service. This has caused a tendency of mission operators building custom-made software for each mission.

Dedicated tailor-made control software makes the mission more expensive, limits the coverage of ground station network and does not enable efficient learning and exchange of know-how between different missions resulting in lower reliability and risk tolerance. The following market gaps have been identified regarding mission controls currently:

- one-off solutions with little scalability (currently the MCS's are developed for each mission from scratch);
- limited radio coverage (1 ground station enables approx. 1 hour of communication time per day);
- lack of experience to operate satellites;
- unutilized ground station resource – ground station equipment often spends a larger portion of time unused than actively tracking and communicating with satellites (the utilisation rate is approx. 5-10%).

At the same time, ground stations have:

- unutilized radio communication resource available;
- limited number of customers.

What if to offer Mission Control as a Service? Missions would benefit from its:

- up-to-date technology – MCS runs on a cloud, does not require any special hardware;
- scalability – enabling simultaneous control of multiple satellites and missions;
- wide radio coverage – up to 24/7 by using different ground stations worldwide;
- reliability and security – constantly improved and tested system with 24/7 support;
- efficient budgeting – decrease approx. 40%, mainly on ground control and radio communication costs by outsourcing different activities.

Ground stations would have an open marketplace, including:

- access to a customer base;
- efficient use of resources;
- monetised operations.

Ground communication and operations has not received enough attention so far. There are too many one-off solutions around, not satisfying the needs of space missions. By using Mission Control as a Service, an access to space becomes easier, affordable and more secure.