Cloud Computing and Big Data Technologies for Ground Systems– GMV Perspective

GSAW 2024 – Working Group D

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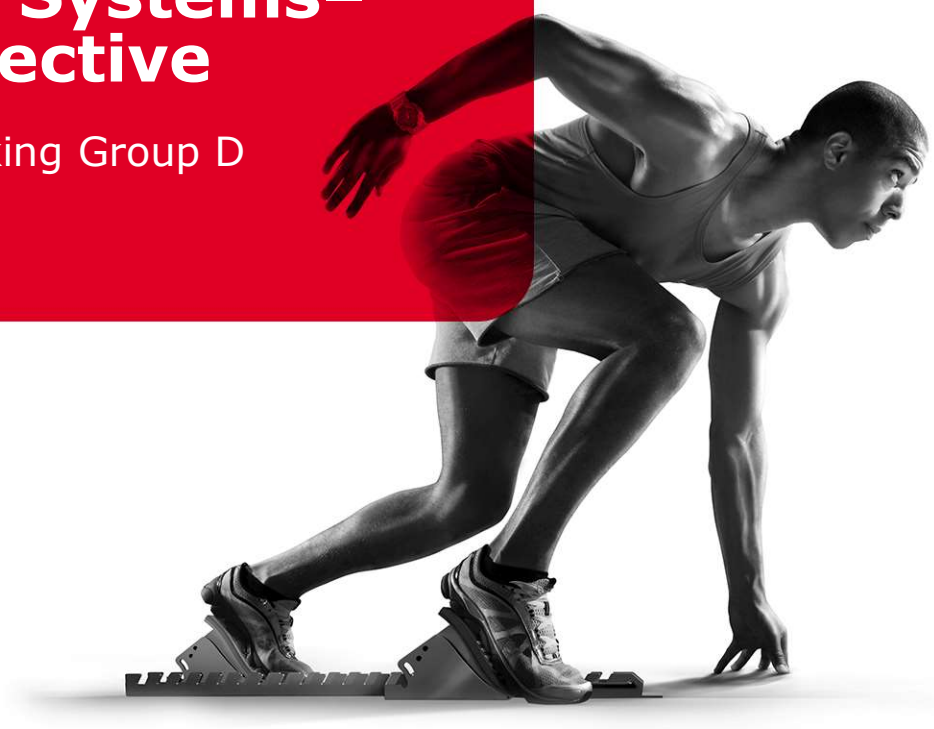


INNOVATING SOLUTIONS

GMV Overview

A global technology group

Multinational technology group

Headquarters in Spain (Madrid)

+3,000 employees

Roots tied to Space

CMMI level 5

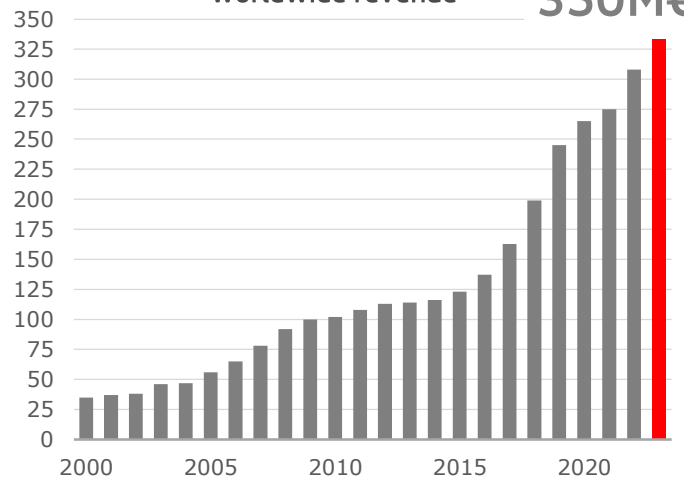
CMMIDEV/5

Private capital

Founded in 1984

Companies in 12 countries

worldwide revenue 350M€



Space, Aeronautics, Defense & Security, Intelligent Transportation, Banking & Finances, ICT Industries

Space	Defense	IT	Transport
56%	11%	16%	17%

GMV in the World

Spain
Madrid – headquarters
Valladolid
Seville
Barcelona
Valencia
Zaragoza

Belgium
Colombia
France
Germany
Malaysia
Netherlands
USA
Portugal
Poland
Romania
United Kingdom

GMV in Space

6th European Space Industrial Group

898 Spacecraft use GMV Technology

1,800 Space Engineers

Satellite Navigation

Ground Segment

Data Processing & Applications

Operations Engineering

Space Safety SST/STM

On-Board GNC, SW, electronics

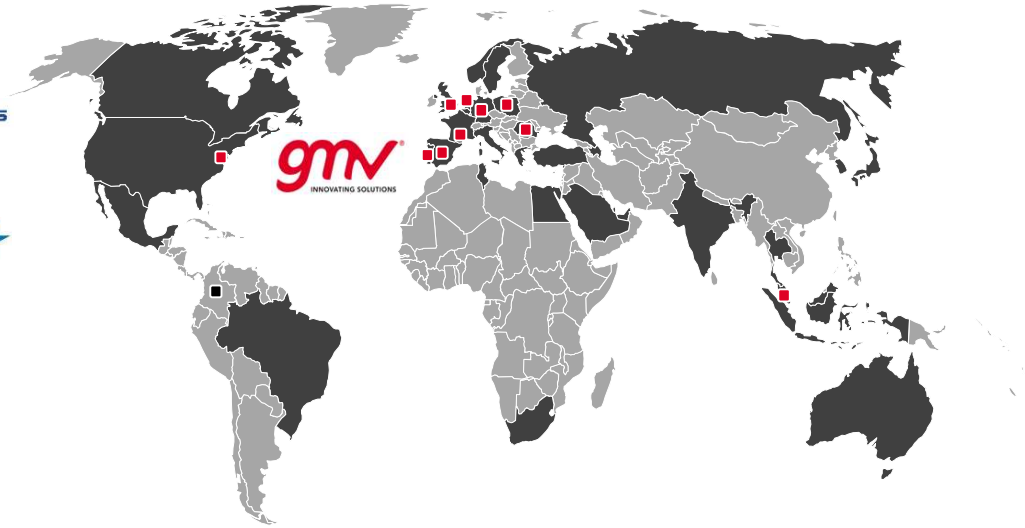
Robotics and OnBoard Autonomy

Cyber security and AI

Main GMV Space Customers

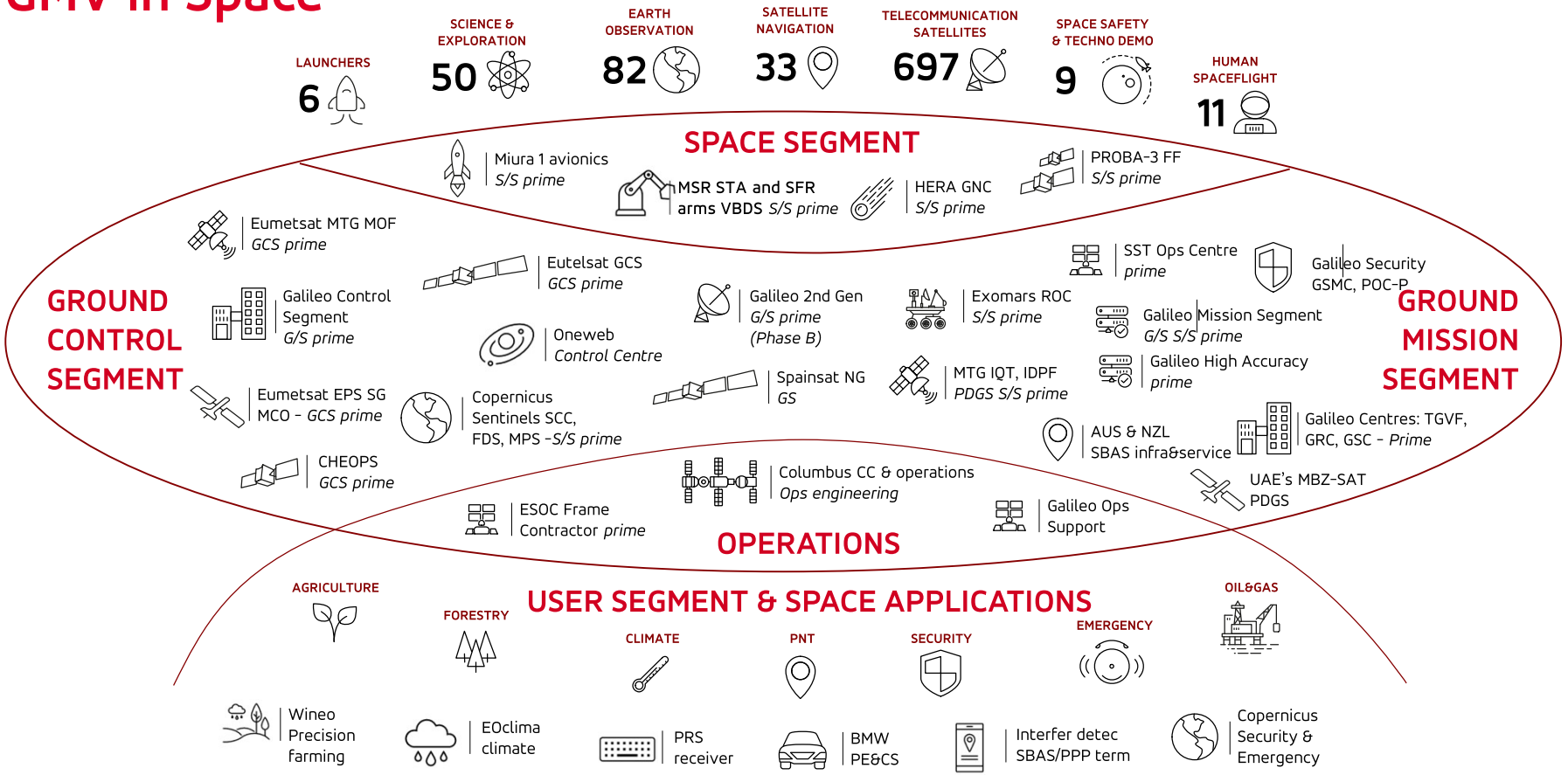
SPACE AGENCIES

TELECOM SATELLITE OPERATORS



SATELLITE MANUFACT. / SYSTEM INTEGRATORS

GMV in Space



Working Group topics

Problem Statement

Working Group F – Main topic: Suitability of Cloud Computing for Satellite Mission Operations

GMV's global vision on Satellite Operations in the cloud:

- Cloud-based ground systems. Requirements.
- Impact on Cloud security, standards, and compliance
- Cloud computing economics.
- Strategies for cloud-based systems.
- Satellite Operation Services
- Data Acquisition and Ground Station Services

Challenges and Stragegies

1
Cloud Provider Selection
Cloud Cost (data transfer, continuous processing)
Cloud provider independency
Hybrid architectures

2
Storage Management
Automatic Scalability
Security / Encryption
Cloud Deployment
Automation
Authentication
CPU efficiency
Interoperability / Harmonizaton / Standarization
Latency
Resilience / Cloud Backup

3
Data Governance and Privacy
Data Sovereignty
Environmental Sustainability

4
Impact on long term missions: SW evolution and Maintenance
Scalable SW architectures / Micro-services
Cost effective products
Legacy SW
User friendly web / Usability
Reusability / Missioniziation

5
"As a Service" business model:
Operations vs SW
Full operations/mission outsourcing
Partial outsourcing of mission components

6
Industry organization and evolution to cloud GS and operations:
Cloud knowledge and expertise
Managed Services
Security
Service Provision processes

Thank you

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INNOVATING SOLUTIONS