



PERASPERA



Evolution of the SRC into Horizon Europe

“An advanced SRC for Horizon Europe, which guides Europe towards a sustainable, highly-automated, flexible and economical viable space infrastructure, enhancing manifold commercial opportunities in space and on earth:

the new space ecosystem.”

Content

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2. What stays the same: the objectives
3. Mission of SRC2.0: Enabling industrialization and business in Space
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5. Expected evolution of planetary robotics



SWOT

Generation of a strategic roadmap towards a long-term goal for European space programme
Deriving short-/mid-/long-term activities from the roadmap that show the way from today
Very good exploitation & dissemination of results by participants

Increase industrial stakeholder involvement in process for calls

Increase membership of PSA to other partners

Increase synergies with terrestrial

Industrial R&D development favoured, little space for Academic freedom

IPR regulation is not covered adequately when pushing commercialization in space

Multi year roadmap which however cannot span automatically EC programmes

Uncertainty over Horizon Europe mandate to implement the high visibility demonstration

US Initiative CONFERS

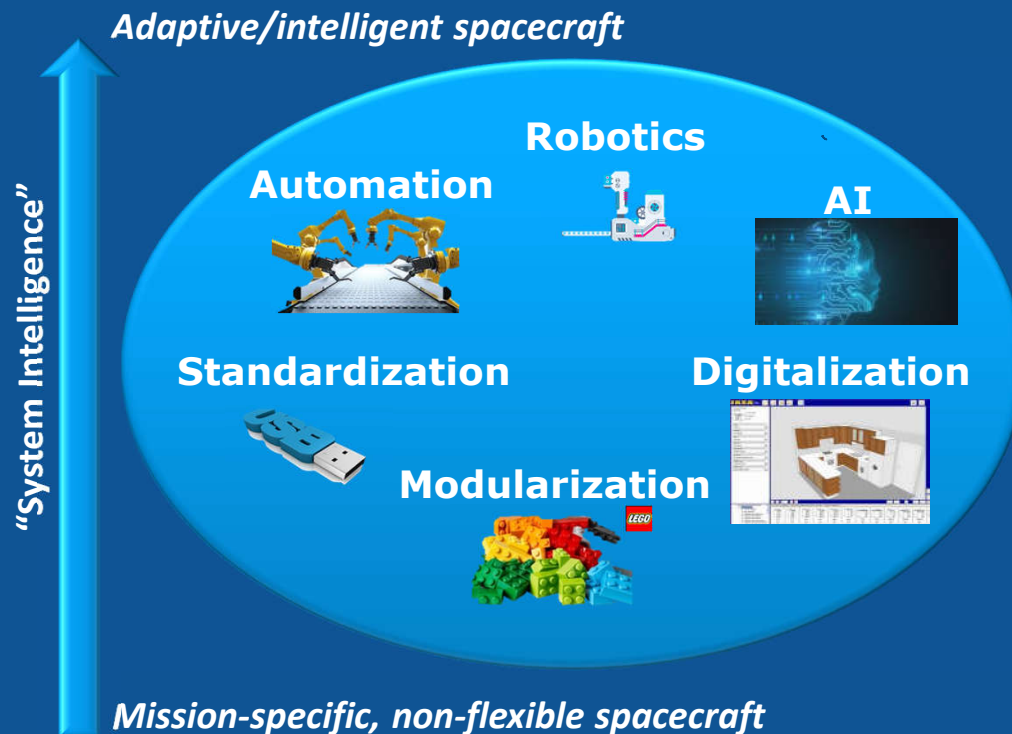
What stays the same: the objectives

1. In FP9 the PSA wants to **continue** to define the **SRC Roadmap** to build highly-automated, sustainable and flexible space infrastructure, enhancing commercial opportunity in space and on earth. The PSA wants to **continue** to be responsible for the identification of strategically important themes to Europe, and also **continue** to support the EC in defining the calls, and monitoring the projects investigating these themes.
2. The PSA will **continue** to pursue **breakthrough disruptive technologies**, such as orbital servicing, artificial intelligence, digitalisation, new industrial processes and innovative approaches for design, production, AIT, logistics and operations in order to strengthen the European position in the space sector.

Mission of SRC2.0: Enabling industrialization and business in Space



Long-term objective:
Highly-automated, flexible, sustainable and economical viable space infrastructure



Building Set/App Store Paradigm

- Introduces new commercial possibilities **"build your business"**
- Reduction of **mission costs** while keeping system diversity
- Increasing **flexibility**
- **Independent development** (platform/application)
- Concentration on core business
- **Rapid development**, Rapid production and Rapid AIT
- Simplified **introduction of innovations**
- Digitalisation of building set supports **flexibility at customer level** and high transparency regarding costs



Expected evolution of space infrastructure

Short term

- Life extension
- Inspection
- Orbit change & debris removal

Mid term

- + Hosted payload/ IOD-V services
- + Exchange of components
- + Debris mitigation
- + Robotised deployment & assembly

Long term

- + Manufacturing in Space
- + Re-configuration
- + In-orbit Recycling
- + Logistics/assembly platforms
- +

Paradigm shift

Automated, flexible space infrastructure based on modular, adaptable design of spacecraft

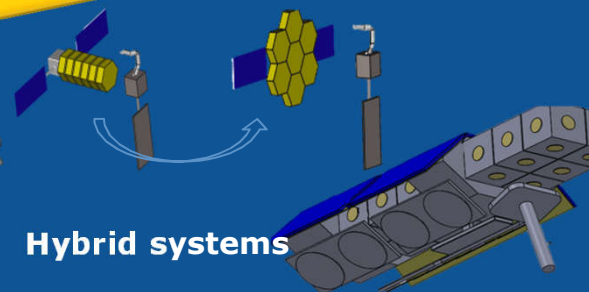
Non-automated, non-flexible space infrastructure based on monolithic, individual design of spacecraft



Classic monolithic systems



Hybrid systems



adaptive/intelligent systems



Expected evolution of planetary robotics

Short term

- + Rover autonomy extension
- + Rover mobility enhancement
- + Improved data fusion capabilities

Mid term

- + Long range autonomy
- + Access to difficult sites
- + Opportunistic science
- + Cooperative exploration

Long term

- + ISRU
- + Cooperative building assembly
- + Human base construction
- + Crews of robotic agents

Fully autonomous robot, flexible robotic agent, crew of robots, Human-Robot cooperation

limited autonomy rover, single-agent mission, limited operating range





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limited autonomy rovers
limited operations



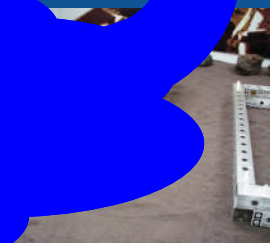
Terrestrial Robotics

Agriculture, Construction, Health, Mining,
Rescue, Maritime, Nuclear

AI

Deep learning, Big Data

fully autonomous robot,
flexible robotic agent, crew of robots,
Human-Robot cooperation





Impact to other branches



Non-automated, non-flexible space infrastructure based on monolithic, individual design of spacecraft

Automated, flexible space infrastructure based on modular, adaptable design of spacecraft

IT & Digitalisation

- Simulations Tools
- Virtual environments
- Digital twins
- Rapid development
- Simplified design tools (building sets)

Logistics & Manufacturing

- Modularity & Building blocks/sets
- Multi-agent cooperation
- Rapid production
- AI

Mining & Nuclear

- Teleoperation & full Autonomy (cooperation)
- Hazardous environment
- High reliability
- Advanced Mobility

Agriculture

- Data Fusion & Mapping
- Opportunistic intervention
- Autonomy & Cooperation
- AI

Maritime

- Autonomy
- Servicing & Inspection
- Sensors & Data Fusion
- Robotics Operative System



Collaboration PERASPERA and euRobotics

First brainstorming results



Building Set/App Store Paradigm

**PSA
PERASPERA**





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Building Set/App Store Paradigm

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