



Transformation Officer

European Space Agency

Artificial Intelligence for Automation

→ THE EUROPEAN SPACE AGENCY

ESOC 2025+ Strategic Vision & Initiatives



Centre of Excellence

A world-class Operations Centre, manager of Space Safety, driver for innovation and enabler of industry

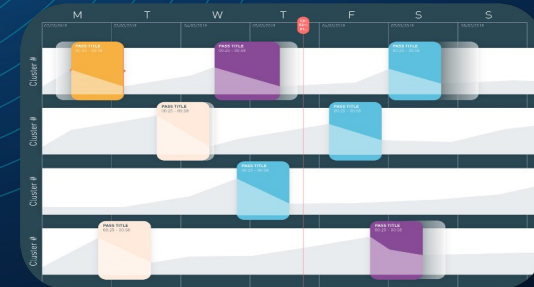
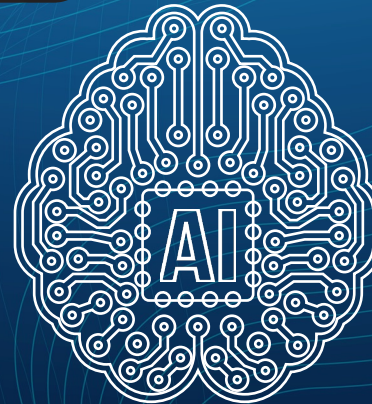
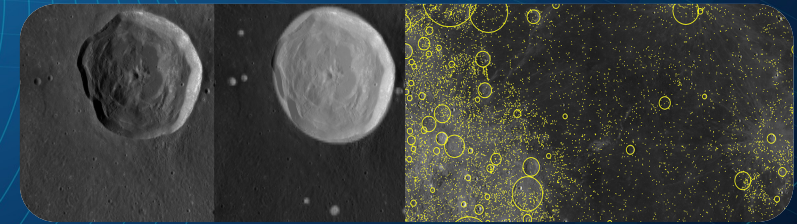
Foster
excellence
in execution
today and
tomorrow

Be at the
forefront of
innovation

By 2030, we want demonstrated AI technologies to enhance operational efficiency and enable twice as many ambitious missions, by embracing fast iterations, and by refocusing intellectual and financial resources

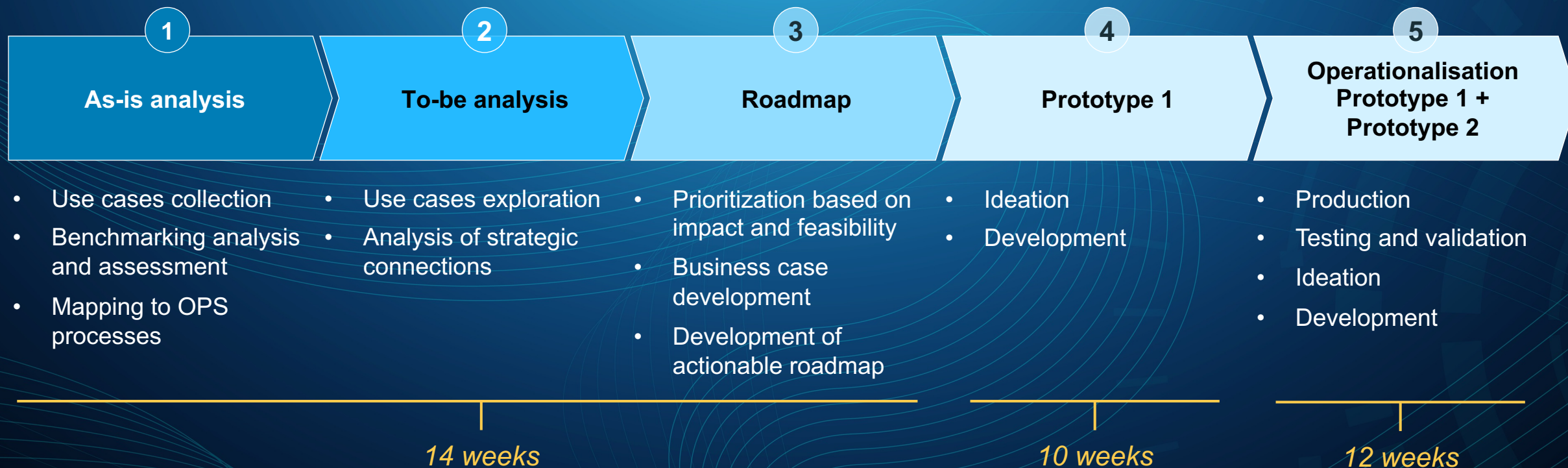


Significant potential for AI in space mission operations



Roadmap to give coherent direction

We followed a rigorous and fast-paced approach



70+ mission operations and AI experts engaged

10 ideation workshops

150+ hours of interviews and brainstorming

A²I: Artificial Intelligence for Automation Roadmap



5 Mission Operations domains prioritized – 14 use cases

Operations preparations
and operational
simulation



2 use cases

System testing and
validation



3 use cases

Ground system
maintenance and ground
operations



2 use cases

Satellite health
monitoring and data
processing



4 use cases

Flight control teams &
ground stations



3 use cases

AI as an enabler to bring automation to the next level

7 archetypes

AI-enhanced
modelling



Automated
content generation



Automated
diagnostics



Automated
prognostics



Decision recom-
mendation engine



Visually enhanced
simulation



AI enabler



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4 activities in GSTP AI Compendium Mission Operations

2 use cases

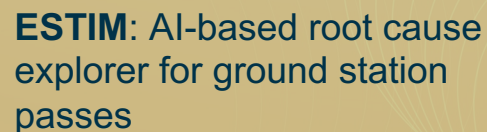
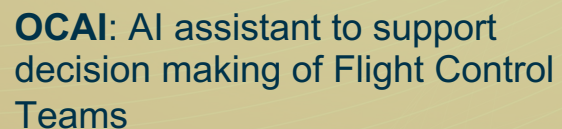
3 use cases

4 use cases

1 use case

- Large activities: 1.2 – 3 MEUR
- Sequence of implementation TBC
- Duration: 10-18 months

- ESA Community License
- Agile approach
- Execution in three phases: MVP development, operationalization, testing and validation



Technology – AI



Implementing the A²I Roadmap presents strong benefits



**Reinforce AI element of ESA
Agenda 2025 and of ESA
Technology Strategy**

**Bolster ESA and the
European Space Sector
as a fore-runner in Europe
of AI in mission
operations**

**Enhance industry competitiveness
by refocusing intellectual and
financial resources**



**Increase efficiency and reduce
costs of space programmes**

**Catalyse development,
adoption, and
capability building
of AI for space**

**Support multi-mission
operation systems**

Challenges in the AI Transformation



Thank you!

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