



SeRANIS

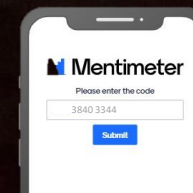
New Space Connected

Adapting Mission Assurance 2024:

Payload-Focused Mission Assurance Process
for the Design Phase of Small Satellite
in Perspective of New Space

M.Sc. Alexander Schmidt

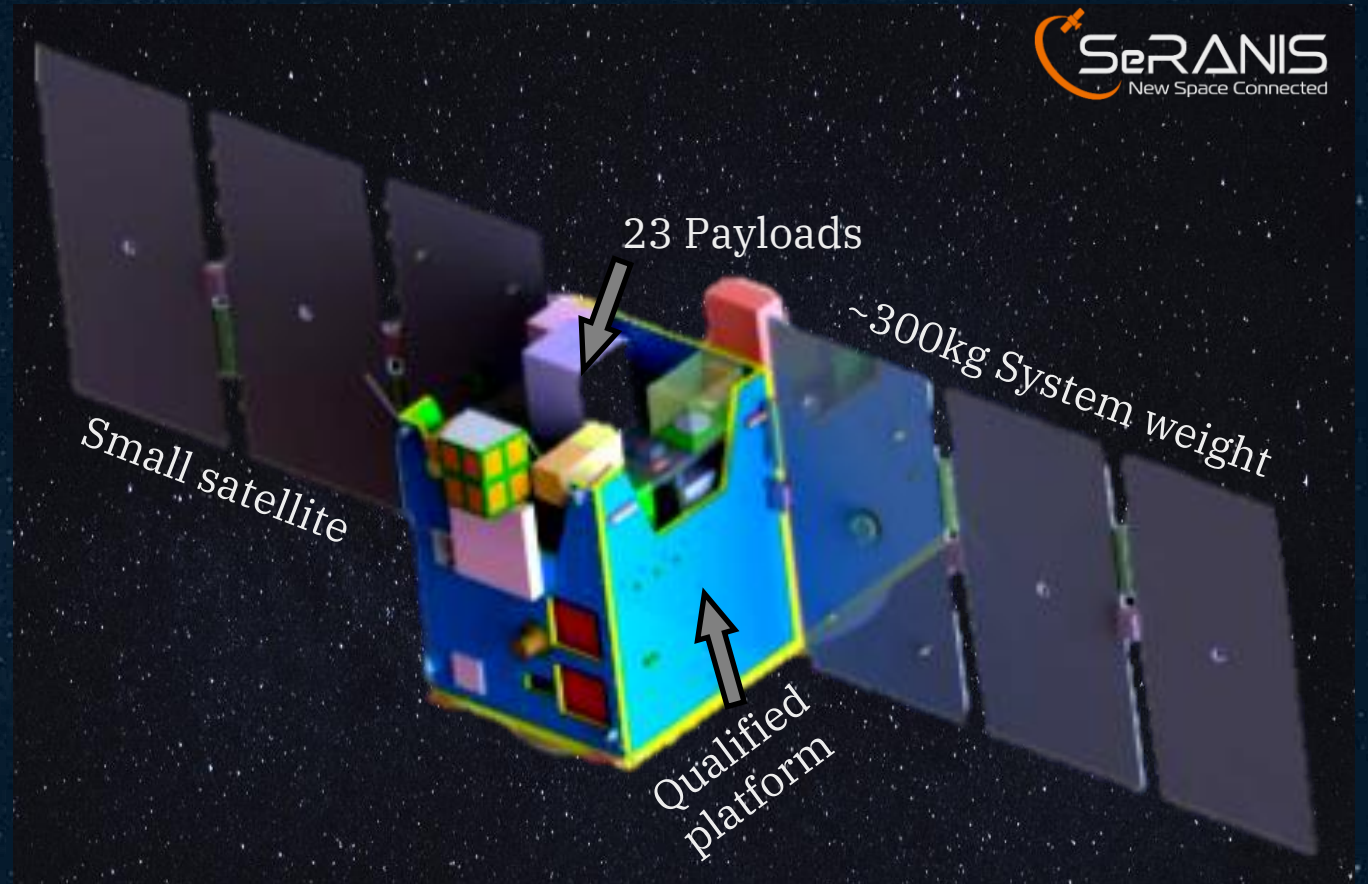
Grab your phone



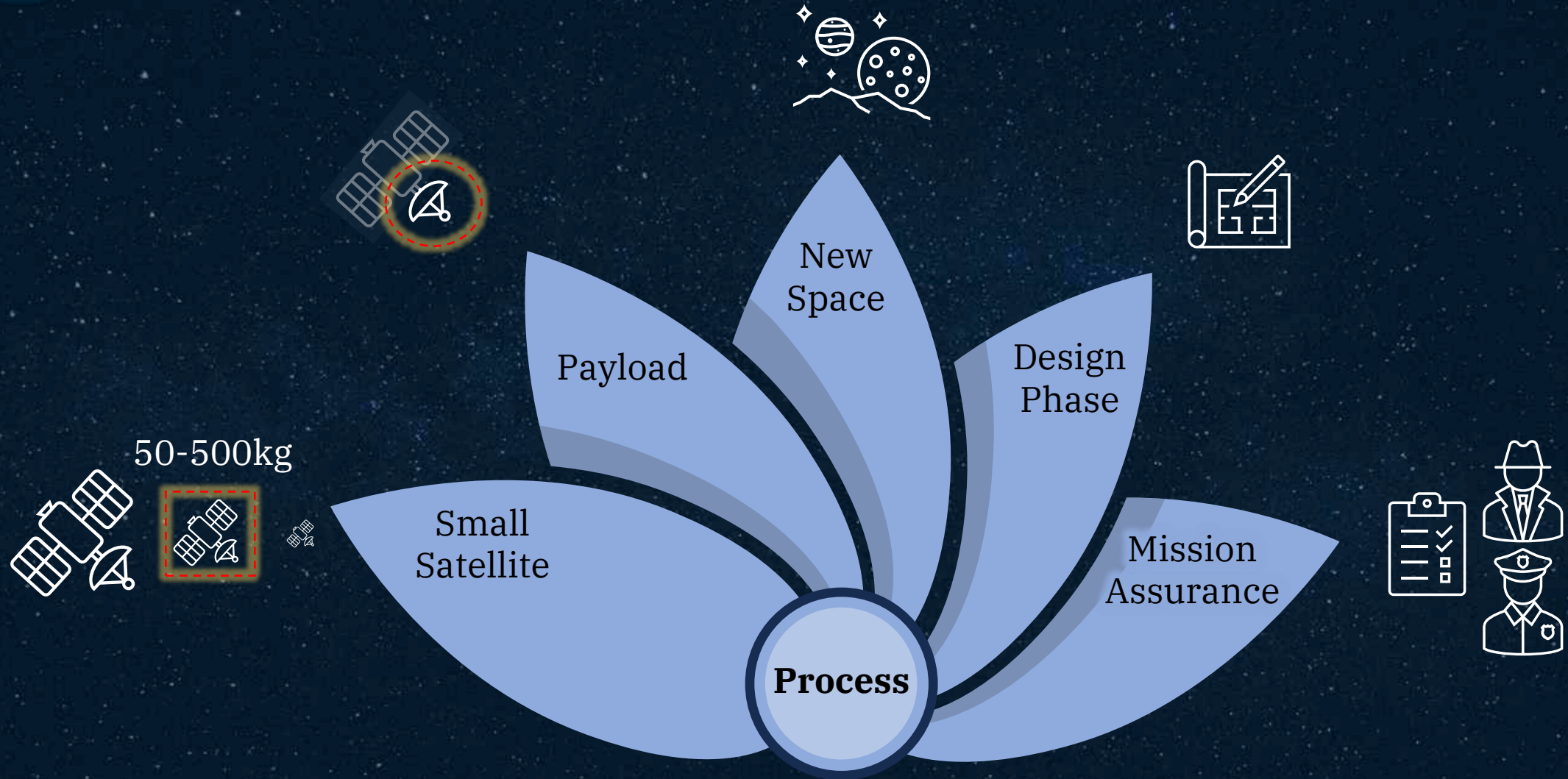
Mission Overview

SeRANIS Mission serves as the research purpose and evaluation environment

- Short time schedule (<5 years)
- Small team (~40 full members)
- Some non-space experts
- New development approach
- Mission Assurance Officer



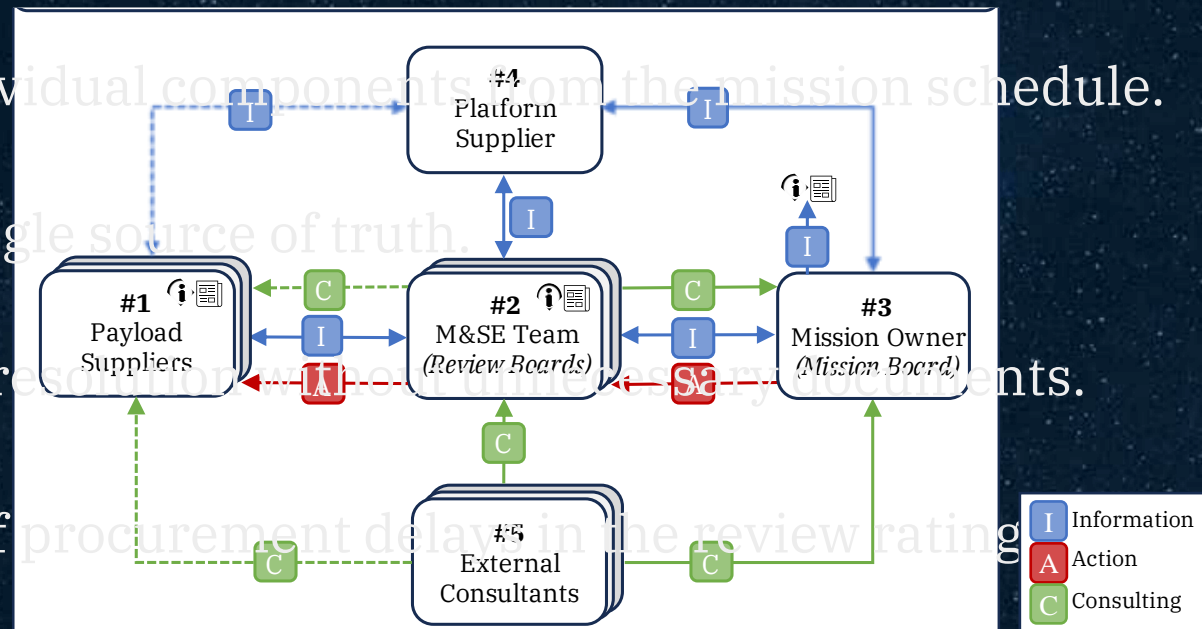
Process Environment



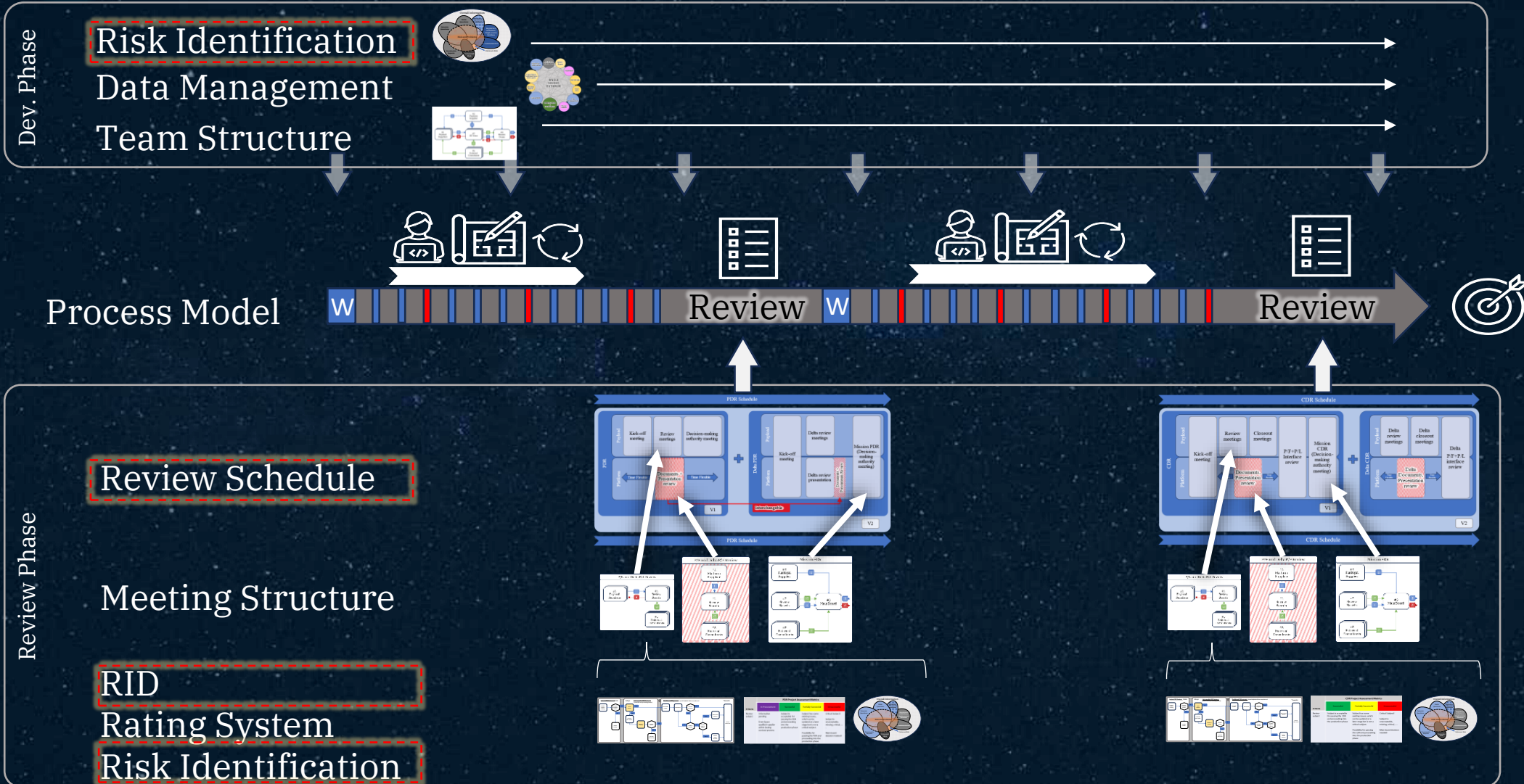
A few Process Goals

The process shall be suitable for:

- Small team, non-space experts and reviewers directly engaged in the project.
- Decoupling individual components from the mission schedule.
- Creation of a single source of truth.
- Immediate RID resolution without the need for unnecessary documents.
- Consideration of procurement delay in the review rating



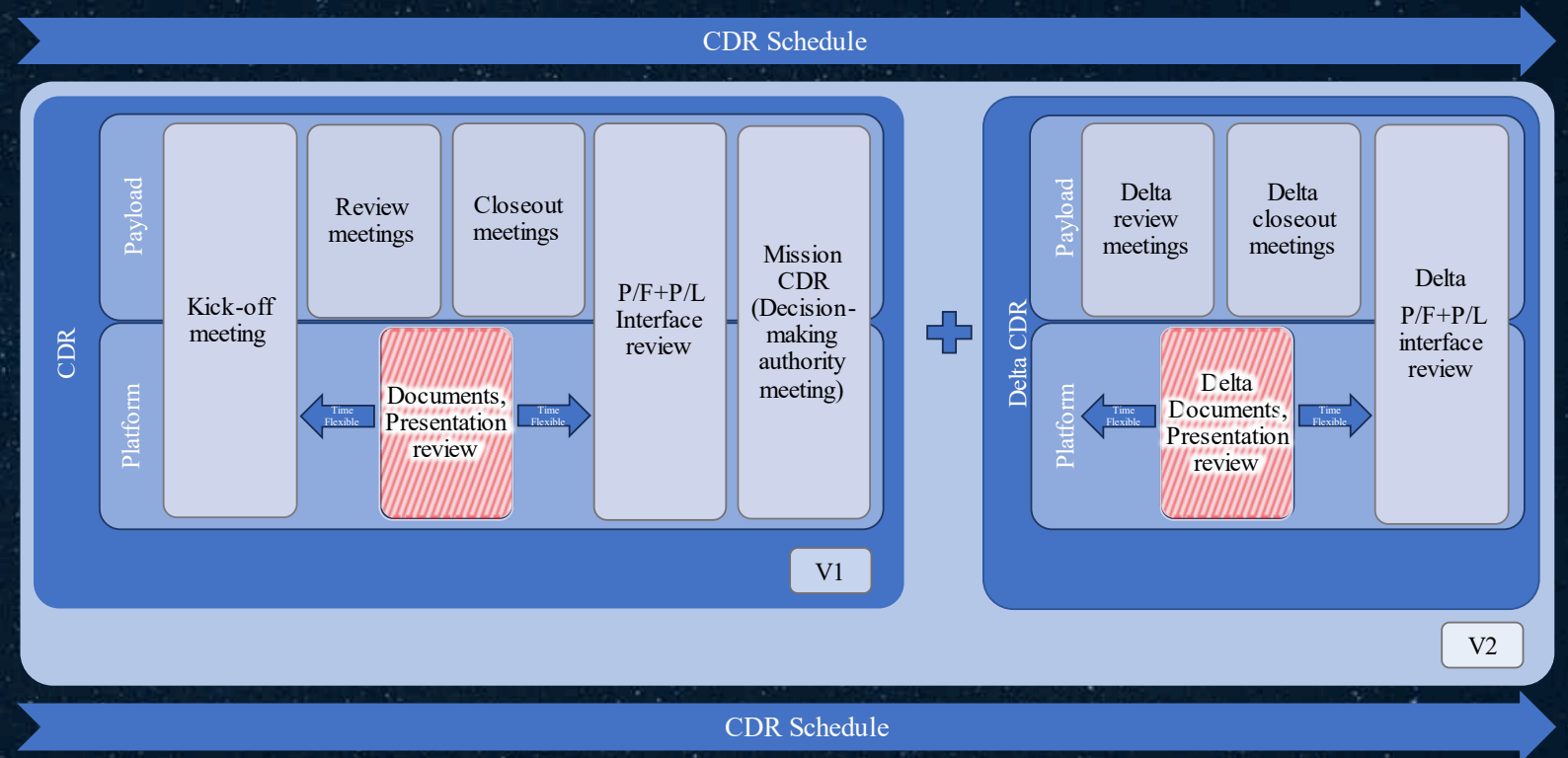
Process Model



* Additional not shown space processes not modified from traditional space approach or out of scope

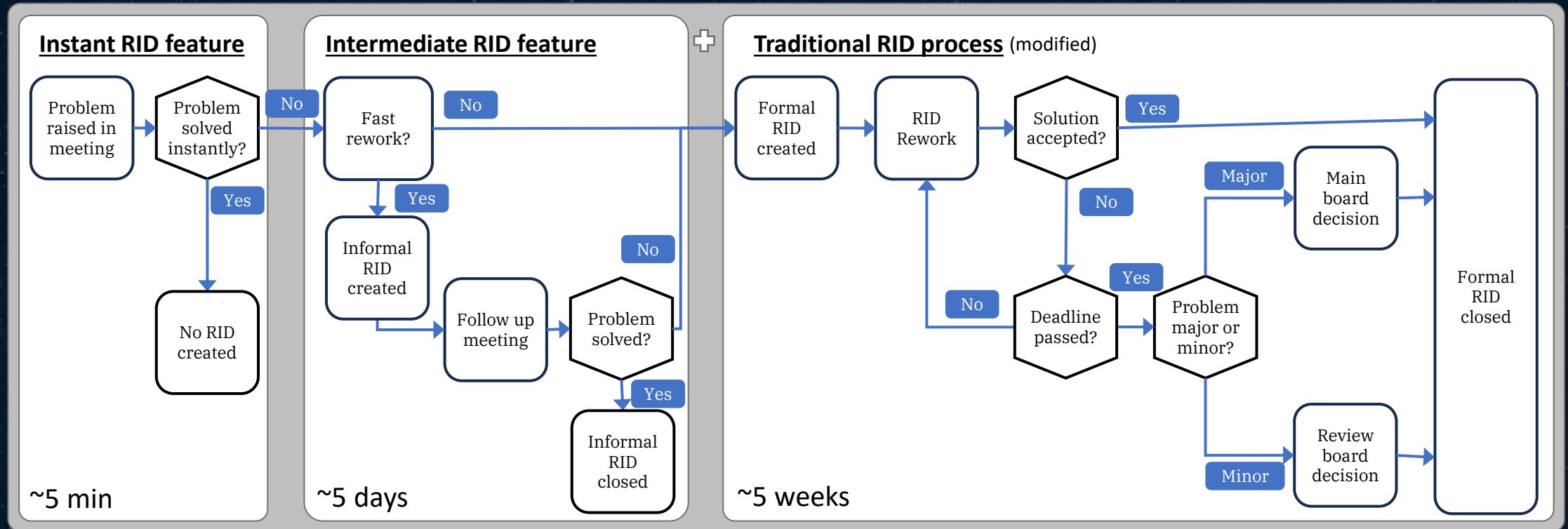
CDR Schedule

- Single CDR (V1) or CDR+Delta CDR approach (V2)
- No delay through full 2nd CDR, if 1st is not passed by all mission payloads
 - Delta CDR decouples individual parts from mission schedule
 - Possible discarding of qualified P/F CDR
- Formal “Mission CDR” with external stakeholder possible





Review Item Discrepancy (RID)



Real Novelty!
Immediate discrepancy
solution without RIDs

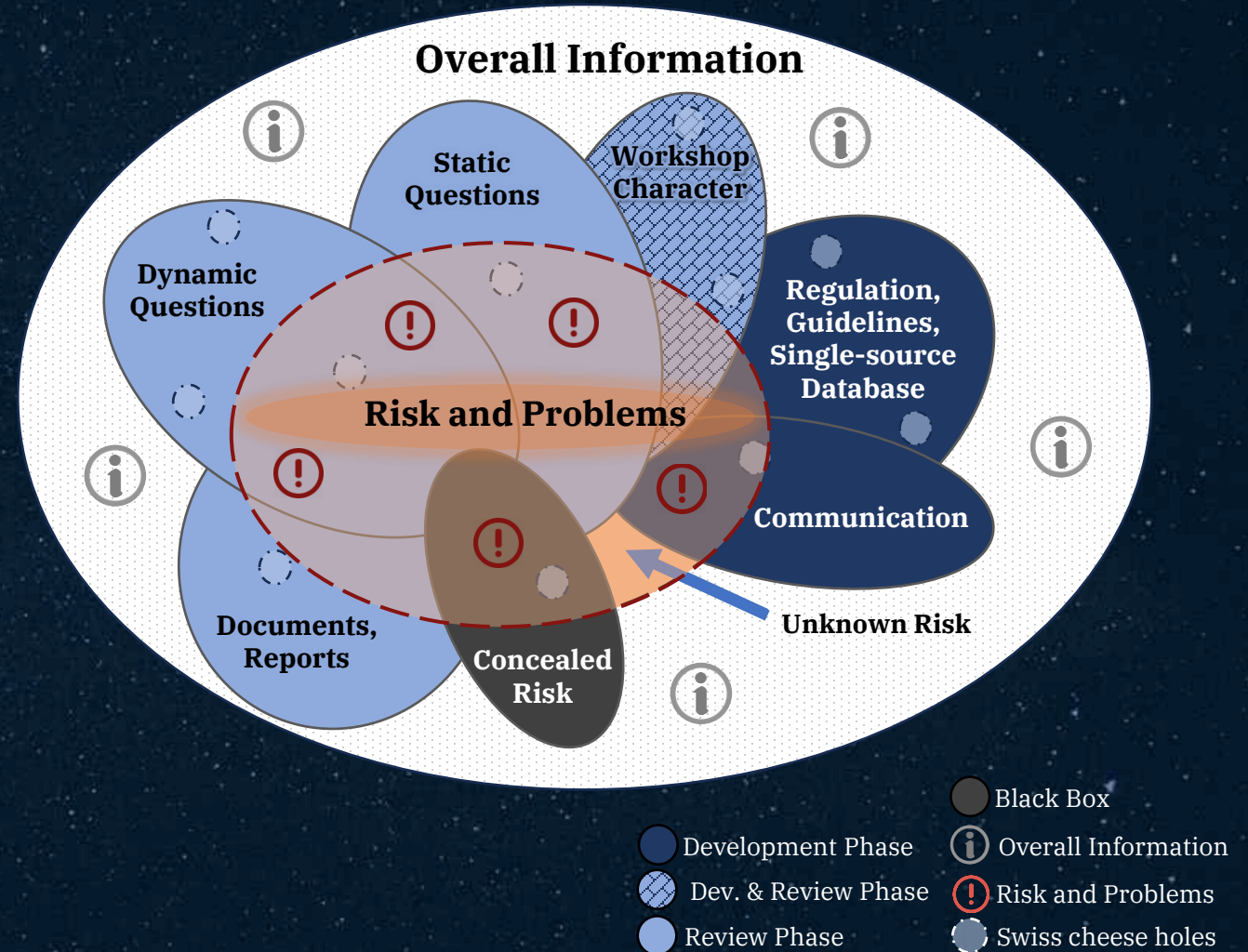
Fast rework with Follow-up
meeting
Encouraged communication
and solution making

General:


- All RIDs directly discussed with the supplier for awareness and understanding
- RID solution directly confirmed by review board, not by review chairperson
- Review not document based with no RID forms and reports

Risk Identification

- Each payload add's "Risk and Problems" to the mission
- Distributing the risk identification task
 - Familiarity of supplier
 - Expertise of reviewer
- Hybrid information gathering
 - Communication,
 - Database,
 - Workshop,
 - Questions,
 - Documents
- Use of the Swiss cheese model



Time to Reflect (2 min)

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Your opinion on the presented topic.

I am generally happy with the process?

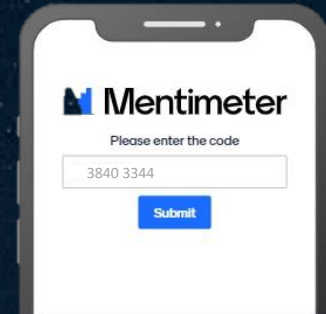
The process provides the necessary level of assurance?

The process is easy to follow and understand?

The process is suitable for other new space missions?

10 Strongly disagree Strongly agree 

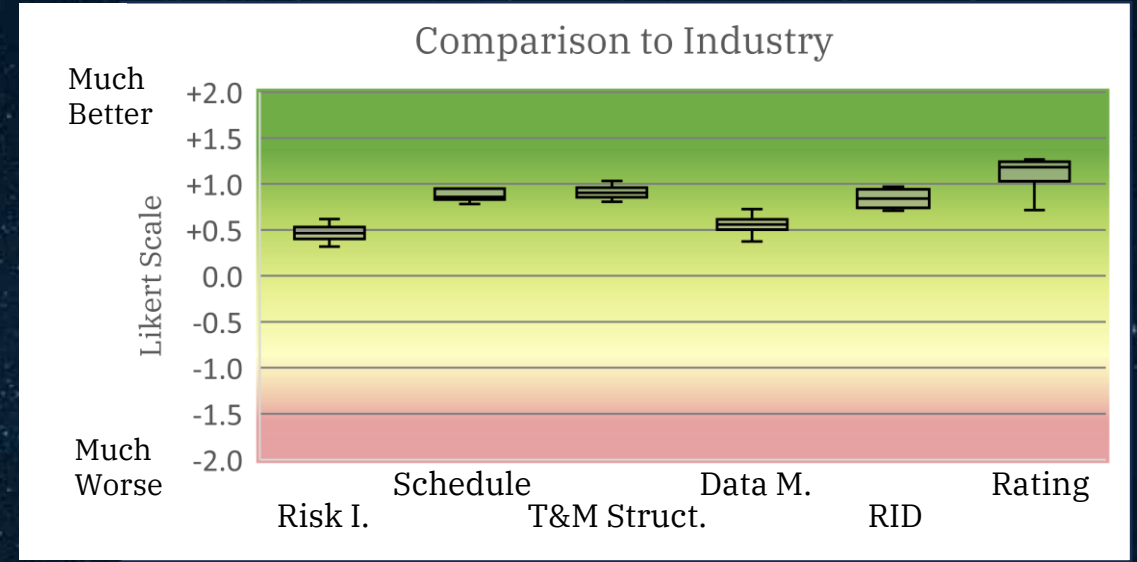
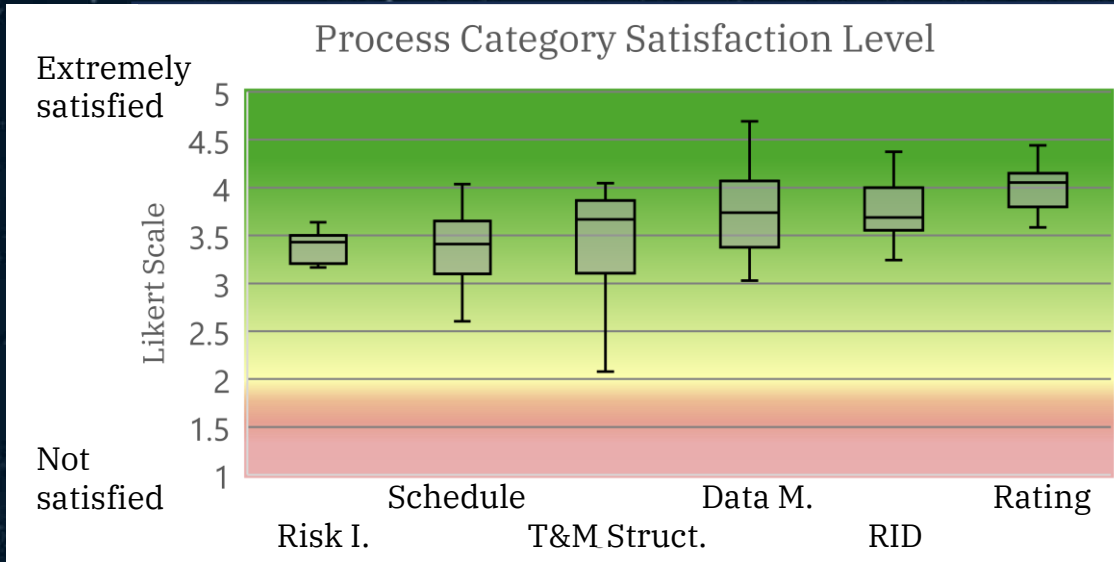
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Project Results



- All categories are rated more than satisfactory (>3)
- Spread is from diversity of participants
 - Different perceptions and requirements of project roles towards the process
 - Different process interaction intensities

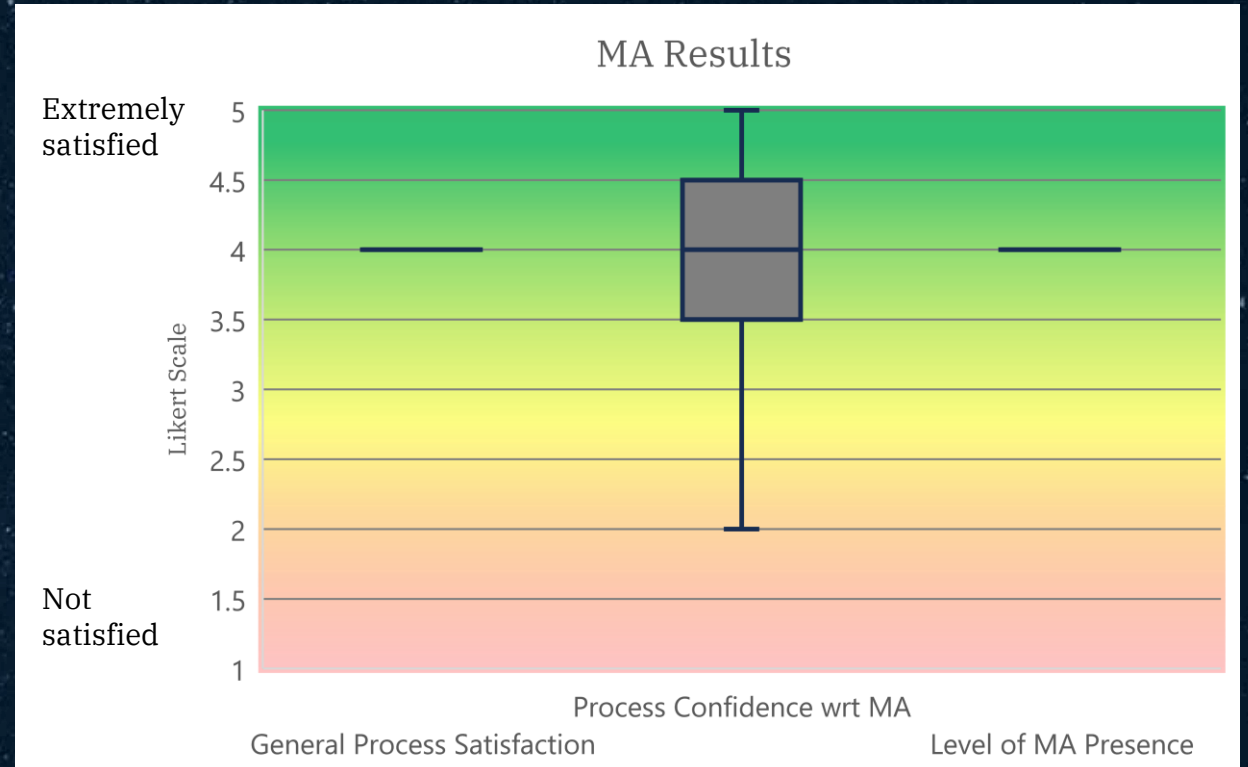
- Accurate results through common understanding of industry capabilities
- Comparison to other reviews and development processes.

*Questionnaire: 42 Payload Suppliers, 9 Mission & Systems Engineers, 7 Mission Owners

*Interview: 8 Payload Suppliers, 4 Mission & Systems Engineers, 5 Mission Owners

Project Results

1. Satisfied with the overall MA process within the mission boundary conditions
2. MA confidence spread by different safety expectations of non space experienced. (e.g. 0% risk)
3. MA presence was flexible and not disruptive.



Thanks for Listening



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