TRA2022

TRANSPORT RESEARCH ARENA
LISBON 2022

POSTER SESSION

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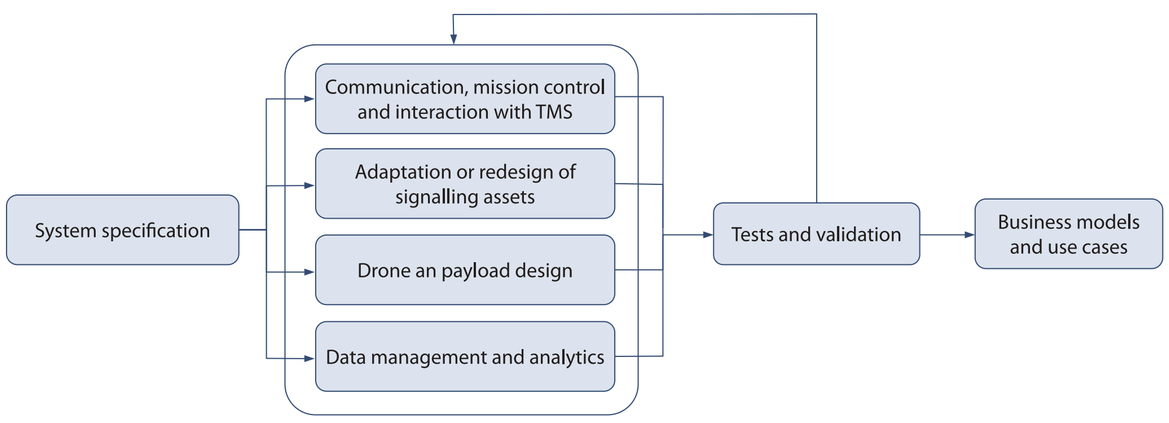
PROJECT RADIUS – Railway digitalisation using drones

Abstract

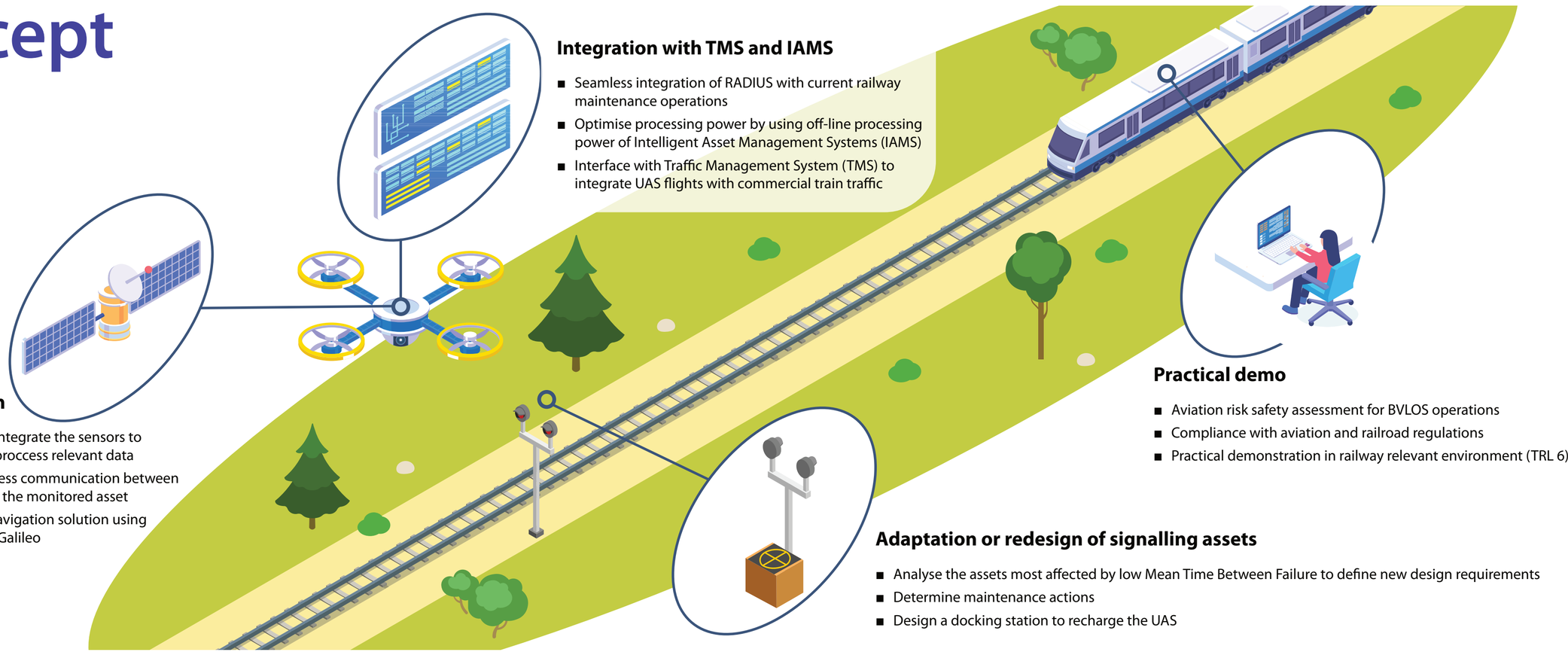
Railway signalling assets monitoring is based on three alternative methods: a) human maintenance; b) wired solutions; c) monitoring trains. These methods impose severe limitations in terms of safety issues, initial investment and complexity, operating costs, limited set of the diagnostic data processed, and track occupation. The direct result of these limitations is that the maintenance activities of railway lines are suboptimal, resulting in preventable failures that require expensive and disruptive reparations that imply the temporal interruption of the service in the affected tracks.

RADIUS proposes to use Unmanned Aircraft Systems (UAS) or drones to execute a large part of the inspection and maintenance tasks of signalling assets that improve on the current methods but require compliance with aviation standards and regulation besides those existing in the railway environment.

Methodology



Concept



Integration with TMS and IAMS

- Seamless integration of RADIUS with current railway maintenance operations
- Optimise processing power by using off-line processing power of Intelligent Asset Management Systems (IAMS)
- Interface with Traffic Management System (TMS) to integrate UAS flights with commercial train traffic

UAS design

- Define and integrate the sensors to collect and proccess relevant data
- Secure wireless communication between the UAS and the monitored asset
- Enhanced navigation solution using EGNOS and Galileo

Practical demo

- Aviation risk safety assessment for BVLOS operations
- Compliance with aviation and railroad regulations
- Practical demonstration in railway relevant environment (TRL 6)

Adaptation or redesign of signalling assets

- Analyse the assets most affected by low Mean Time Between Failure to define new design requirements
- Determine maintenance actions
- Design a docking station to recharge the UAS

Consortium

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EUSPA European Union Agency for the Space Programme

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