JARVIS

Just A Rather Very Intelligent System

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JARVIS

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Partners

Kick off: June 2023
Duration: 3 years
16 partners
9 countries

Coordinator

Collins Aerospace
An RTX Business

CIRA
Italian Aerospace Research Centre

ATHENS INTERNATIONAL AIRPORT ELEFTHERIOS VENIZELOS

DLR

deepblue
consulting & research

nais

CRIDA

nlr

indra

ENAIRE

AIRBUS

enav

LEONARDO

BOEING

ENAC

EUROCONTROL

Swedavia Airports

+

EASA
European Aviation Safety Agency

(service agreement)

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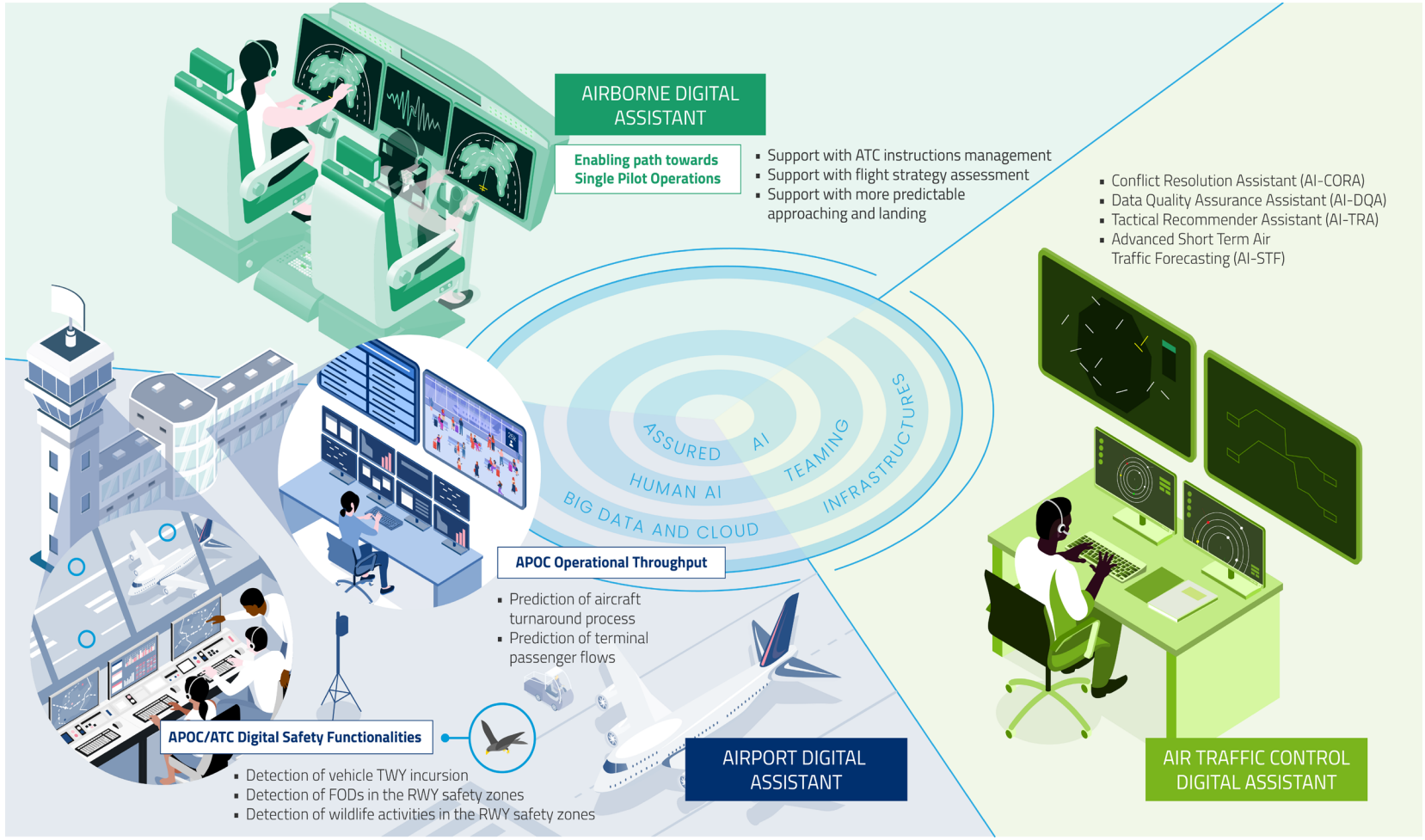
ATM digitalization is revolutionizing the aviation ecosystem
JARVIS takes up the challenge



- JARVIS will develop and validate **3 new digital assistants** based on **AI technologies** that would enhance existing ATM operations and enable new ones
- **Key target** – increase human performance: acceptability, situational awareness, workload
- First steps towards **SRIA Automation Level 4**, Enhanced Ground Ops and Single Pilot Ops
- **Human-centric** design approach, readiness for approvals and **certification of AI**

JARVIS Concept Image

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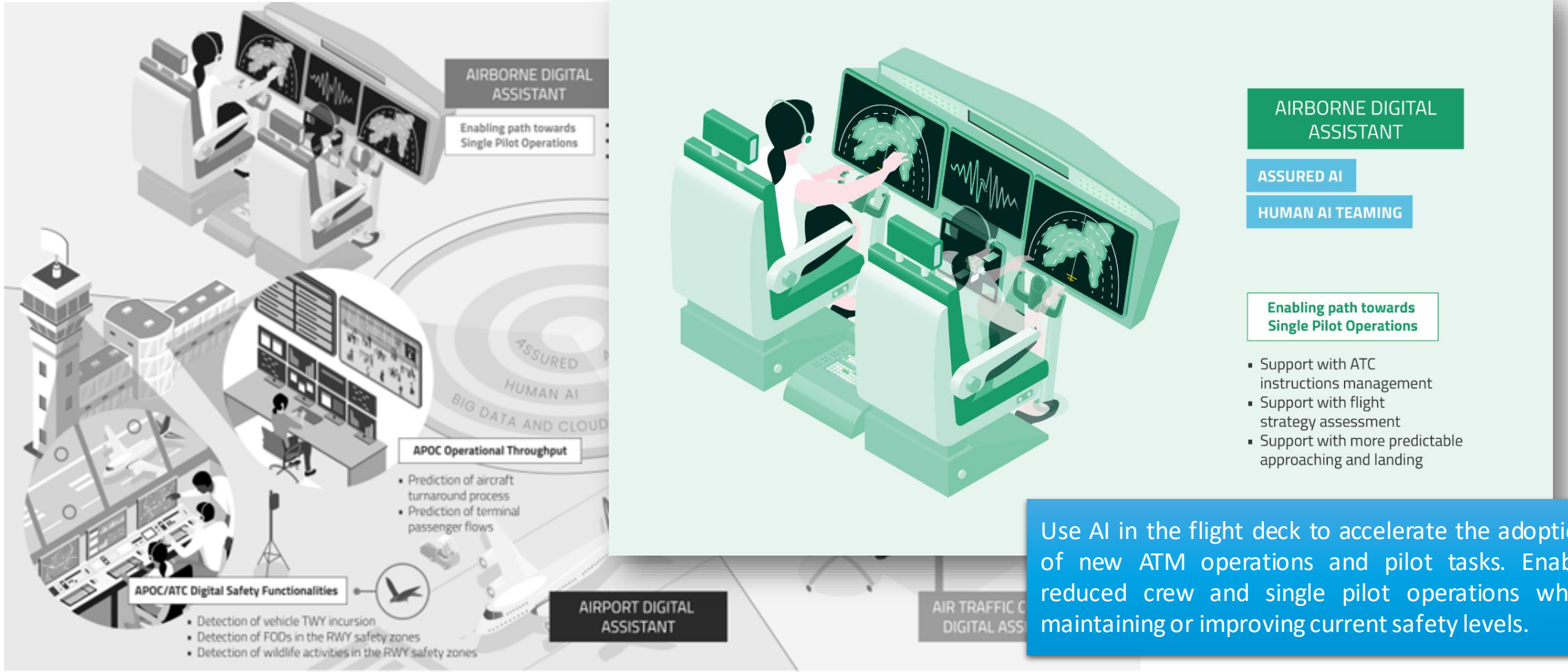
Airborne Digital Assistant (AIR-DA)

Target: TRL4



Use AI in the flight deck to accelerate the adoption of new ATM operations and pilot tasks. Enable reduced crew and single pilot operations while maintaining or improving current safety levels.

JARVIS Concept Image

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JARVIS ATC Digital Assistant (ATC-DA)

Target: TRL4

Assist controllers in different roles, tasks and operating environments to reduce their workload, improve performance, capacity and operational efficiency, while safeguarding safety. ATC-DA will pave the way towards cooperative human-machine execution of ATC tasks.

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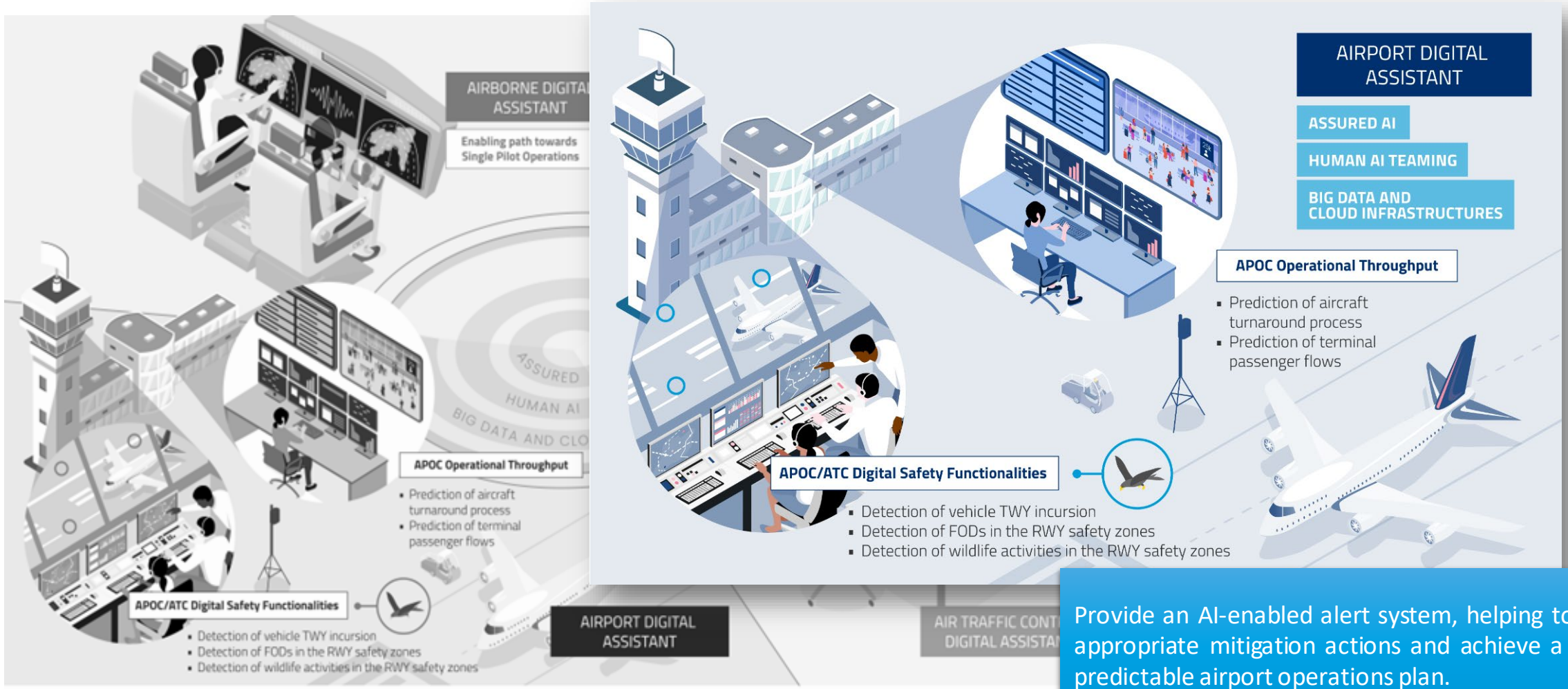
JARVIS Airport Digital Assistant (AP-DA)

Target: TRL6



JARVIS Concept Image

Provide an AI-enabled alert system, helping to take appropriate mitigation actions and achieve a more predictable airport operations plan.

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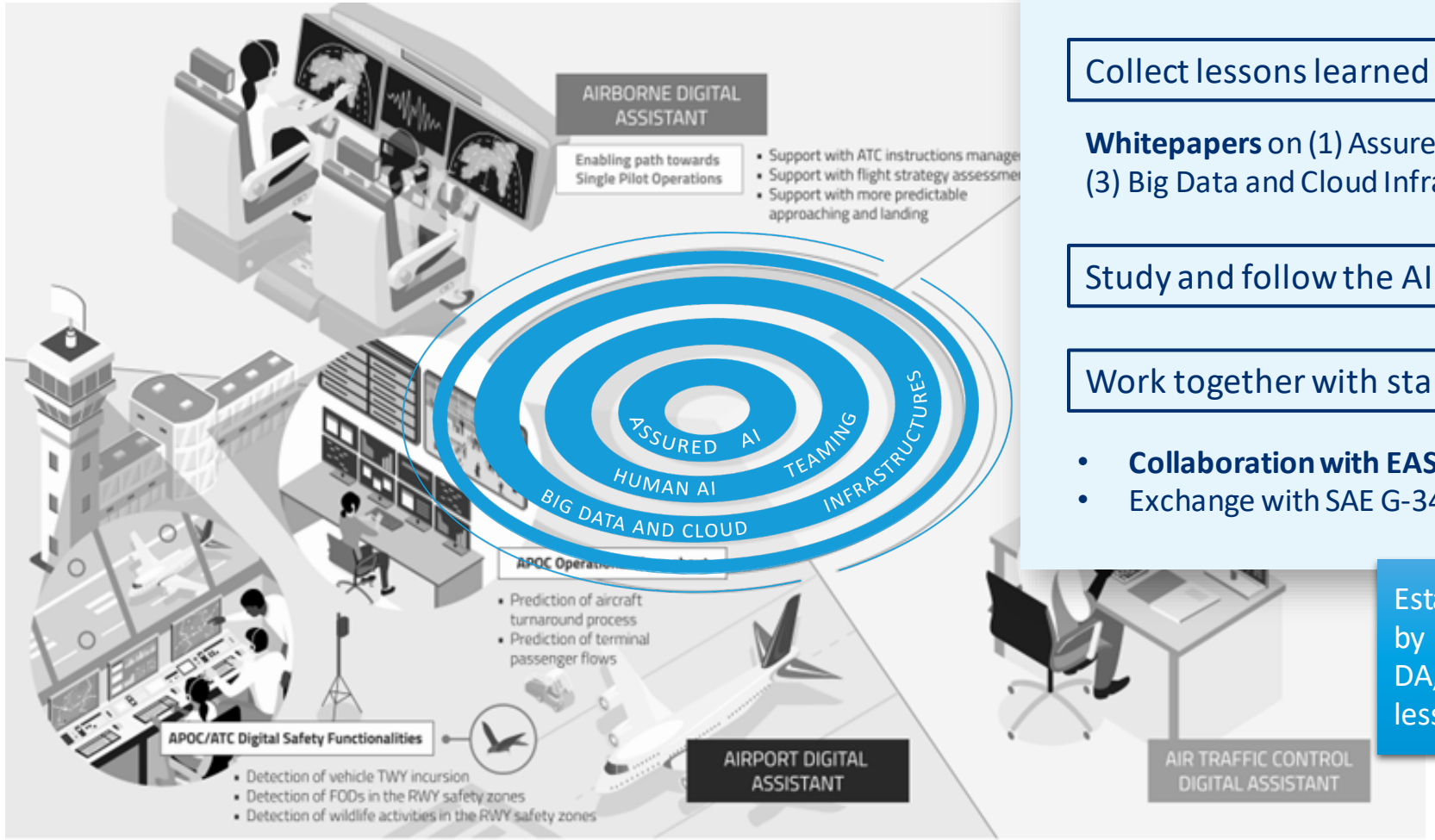
JARVIS Foundational AI Capabilities



JARVIS Concept Image

Collect lessons learned across solution work packages

Whitepapers on (1) Assured AI Design (2) Human-AI teaming (3) Big Data and Cloud Infrastructures

Study and follow the AI regulation (e.g., EASA, EU AI act)

Work together with standardization and regulation bodies

- **Collaboration with EASA** (details on next slide)
- Exchange with SAE G-34/EUROCAE WG-114, S18a

Establish a common methodology for AI in JARVIS by coordinating with solution work packages (AIR-DA, ATC-DA and AP-DA) and collecting results and lessons learned on foundational AI topics.

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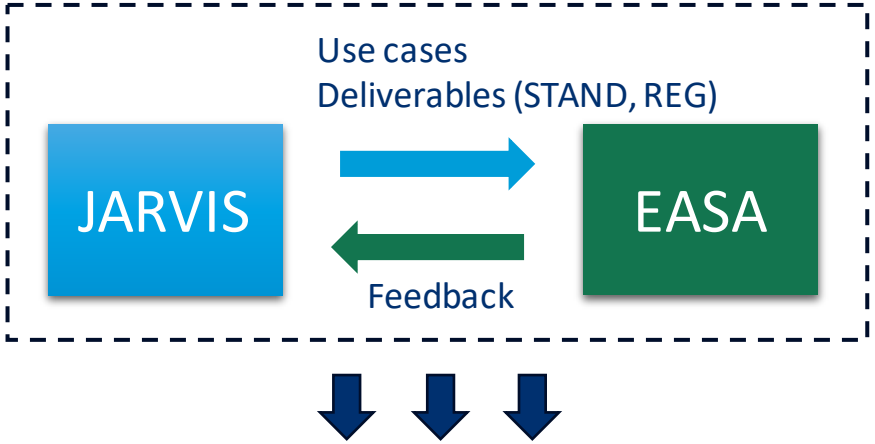
JARVIS EASA Collaboration

- **Goals:** Facilitate future approvals of AI-enabled ATM systems and understand the impact of introducing AI on existing regulatory procedures
- **Solution maturity progression:** Regulation-related deliverables for each JARVIS solution will be reviewed by EASA (focus on AI-related aspects)
- **AI research:** Contribute to the advancement of the AI Concept Paper with innovative feedback from JARVIS
  - **High-priority topics:** Human-AI teaming and AI technologies different from supervised ML (e.g., logic and knowledge-based systems, reinforcement learning)
  - In-depth investigation of several relevant use cases



1. Analysis of the impact on existing regulations validated by EASA
2. Contribution to future versions of AI concept paper and regulation

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Takeaways

- AI will shape the future of ATM applications and impact existing standards, processes and regulations
- JARVIS takes up the challenge by developing AI-enabled digital assistants to assist pilots, ATC and airports
- Gathering existing and new knowledge on foundational AI aspects will enable future maturation steps of digital assistants and higher automation
- Early identification of AI certification paths and alignment with emerging guidance is key to success

Thank you

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