Implementation of TAM Driven by Al Agents



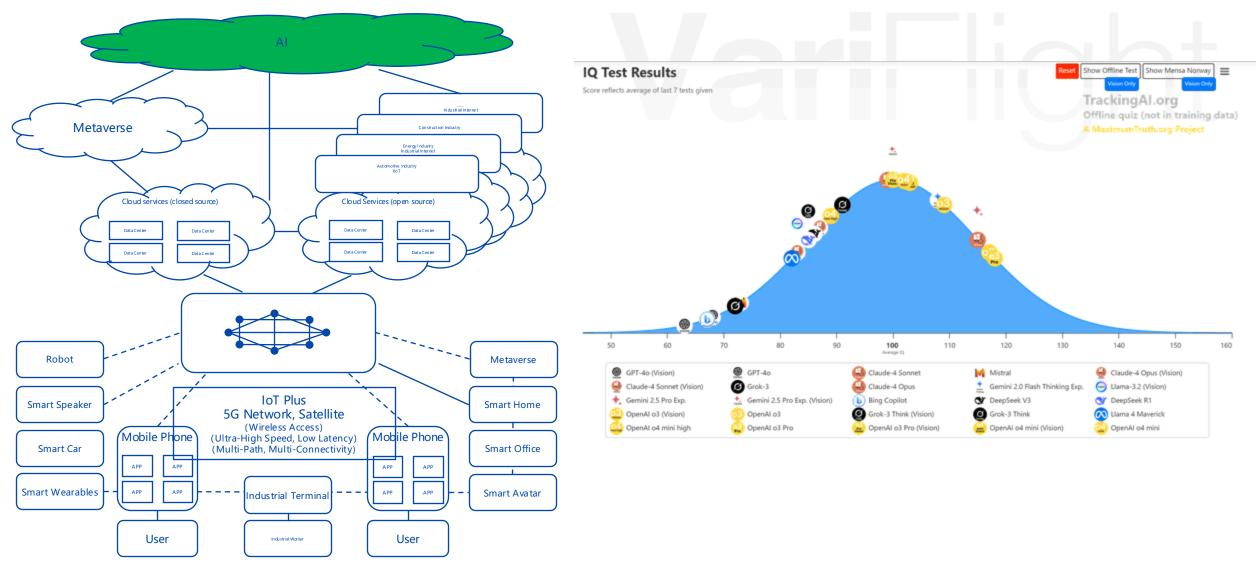
1 CHALLENGES

Why TAM?

- Preparing the Airport Side for TBO;
- Among the global TOP 100 airports, as many as 82% of airports have a base airline with a
 market share of less than 60%; thus, airports need to play a leading role in digitalisation and
 intelligence;
- The challenges of civil aviation safety are increasingly concentrated on airports;
- Flight regularity decreases as the scale of the airport increases;
- The efficiency of ground operations decreases as the scale of the airport increases; and
- Challenges from unmanned vehicles and drones.



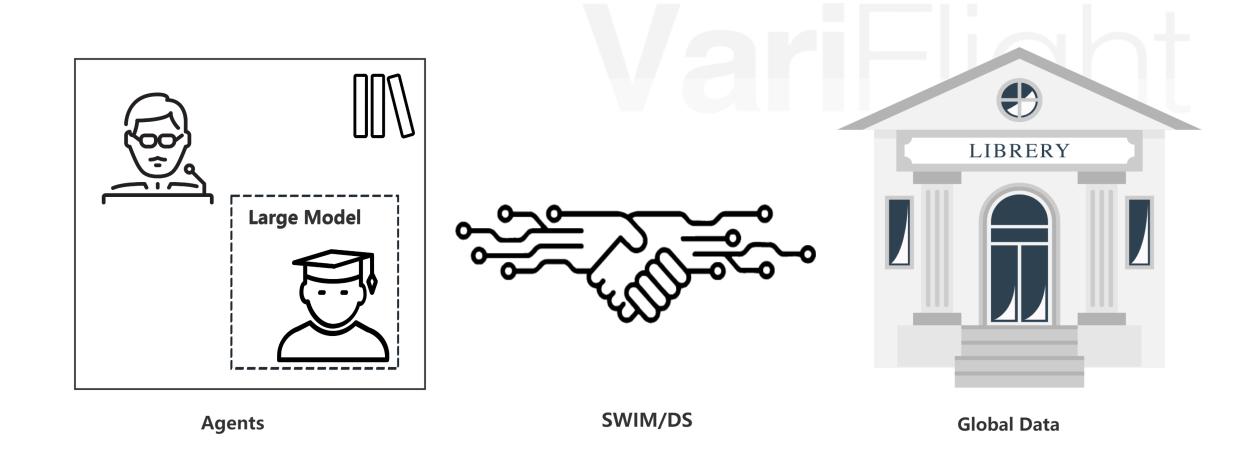
Al Opportunities



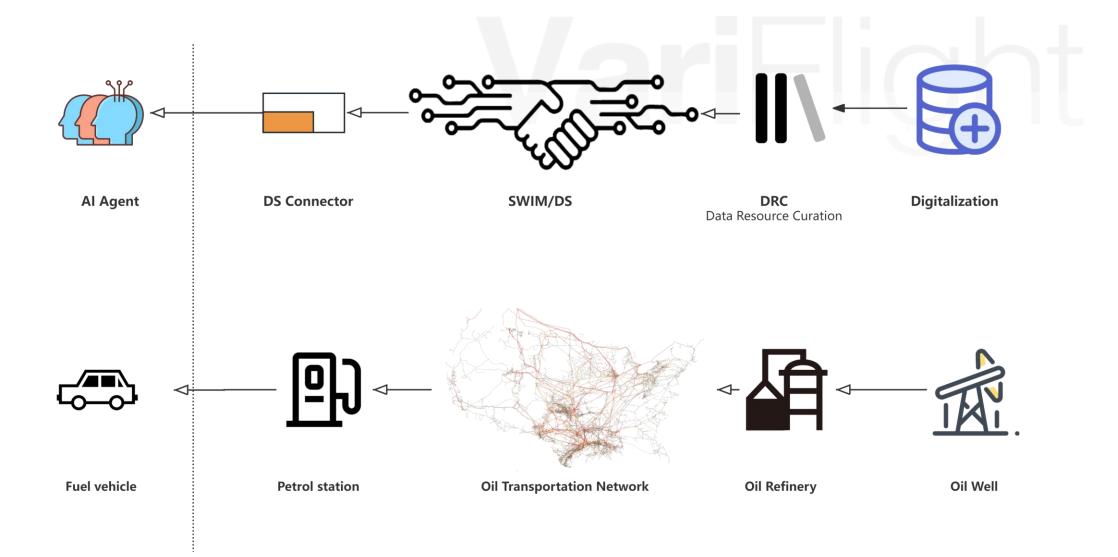
VariFlight's Technical Approach to Achieving TAM

AI Agents

Relationship Between Agents and LLMs

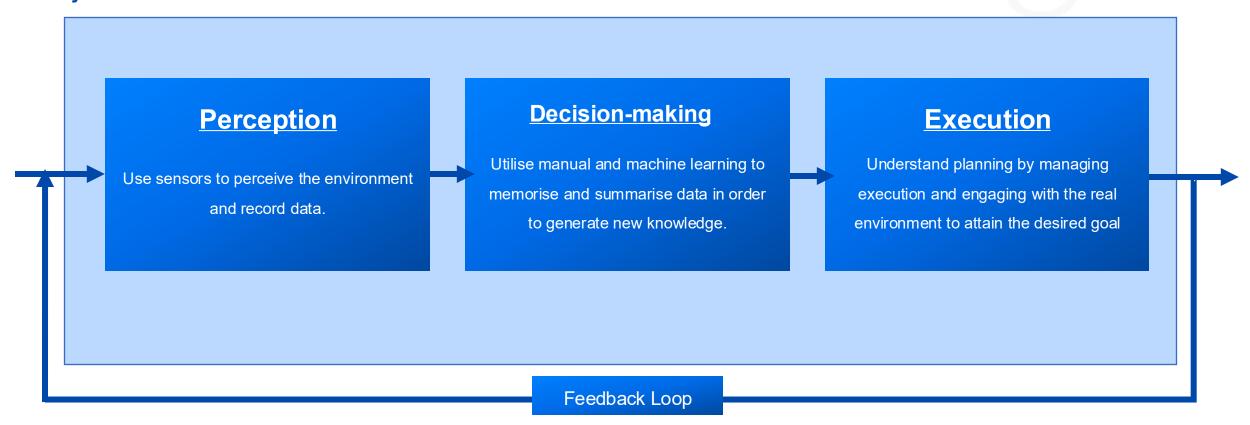


Key Technologies in the Intelligent Era

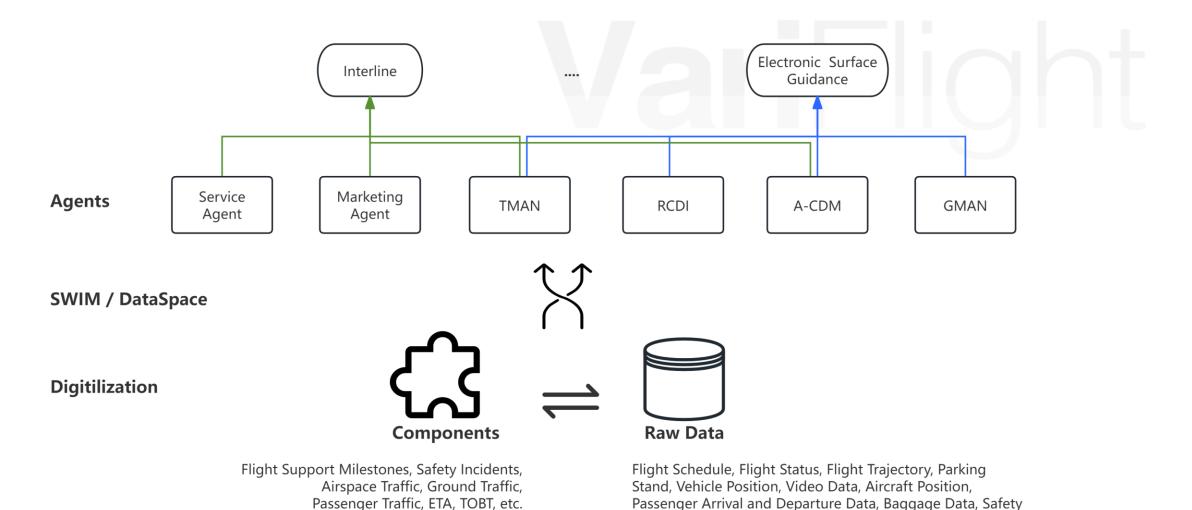


Al Agent Technical Principles

Al is fundamentally the capacity to acquire and utilise knowledge in order to achieve objectives.



Integrating Digitalisation, SWIM/DataSpace, and Al Agents



Regulations, Weather Observations and Forecasts, etc.

Al Professional Capability Building in Aviation

Agent Application

Delivers aviation-focused user experiences by plugging domain-enhanced Al into real-world workflows.

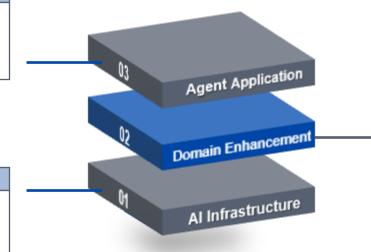
Al Infrastructure

Provides the core offline

scale reasoning and

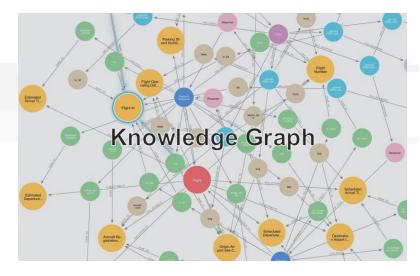
generation.

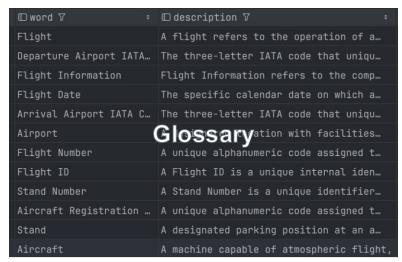
LLMs, data pipelines, and compute that power large-



Domain Enhancement

Provides civil-aviation glossaries, ontologies, and rule-based knowledge graphs that inject authoritative industry context into the LLM.



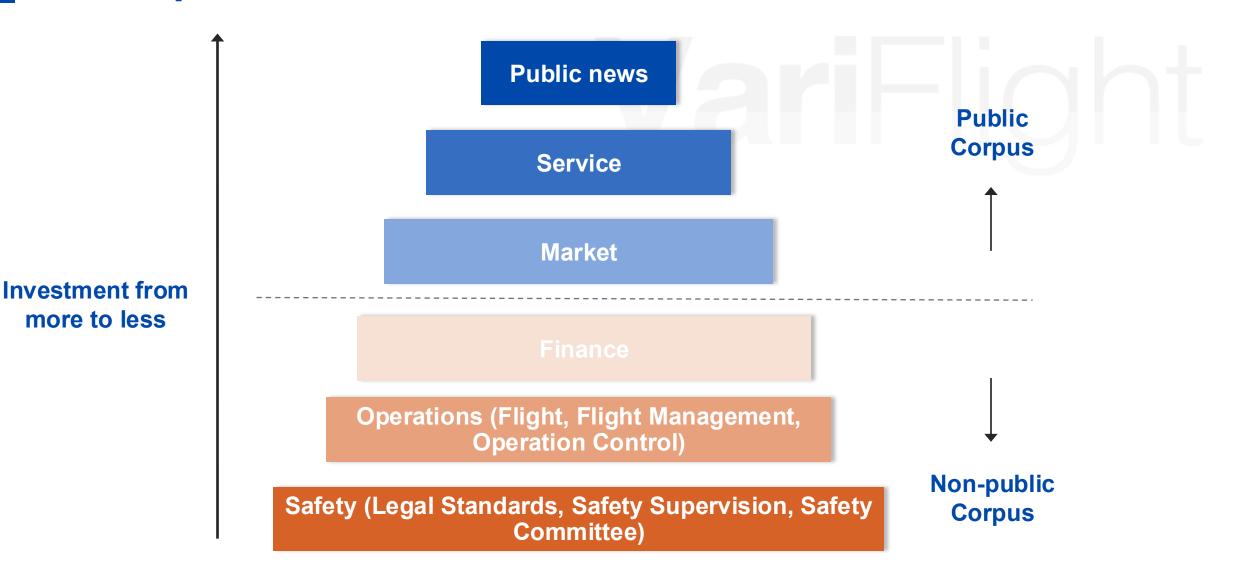




VA Agent
Visual Analyse Agent

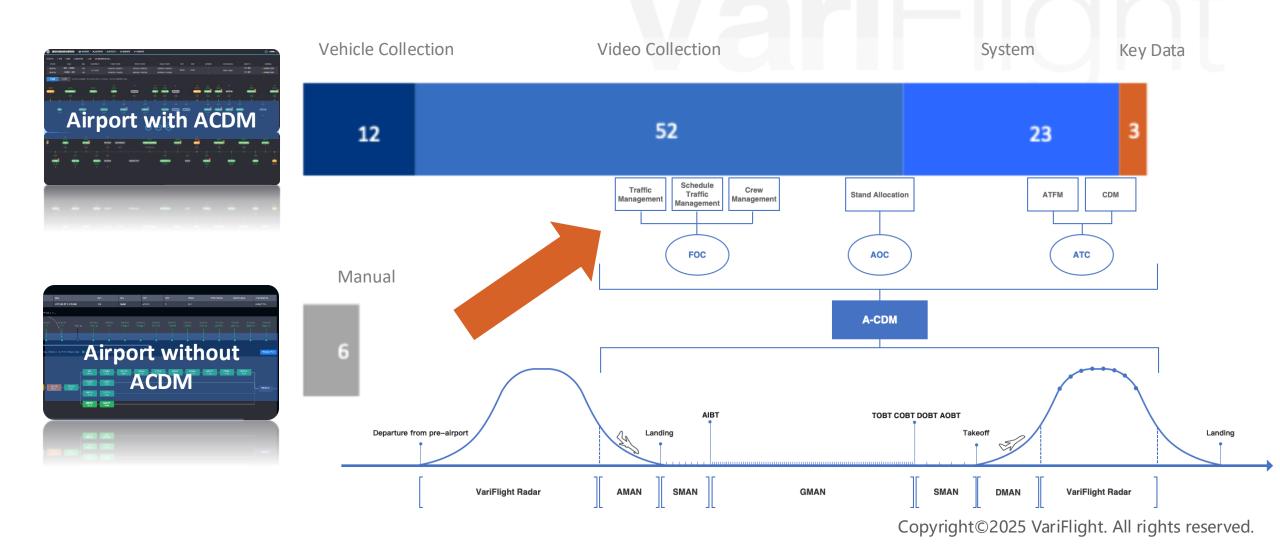
The Importance of Data for Future Al

more to less



Enhancing Airport Perception Capabilities

Utilising Technologies such as IoT and Intelligent Video Analytics



VA Agent – Automatic Detection of Flight Handling Events



VA Agent – Detection and Identification of Aviation Safety Events





- 1 Guardrail of passenger stairs: OK
- 2 Command of passenger stairs: OK
- 3 Push-out monitoring: OK
- 4 Reflective cones: set up
- 5 Reflective cones: not set up
- 6 Stand suitability: inspected
- 7 Taxiway intruded when aircraft passes
- 8 Taxiway OK when aircraft passes
- 9 Vehicle illegally parked
- 10 Equipment not removed
- 11 Overlapping crossing area intruded
- 12 Stand OK when aircraft arrives
- 13 Stand OK when aircraft departs

SURF Agent Surface Management Agent

Converting Voice Commands into Digital Maps

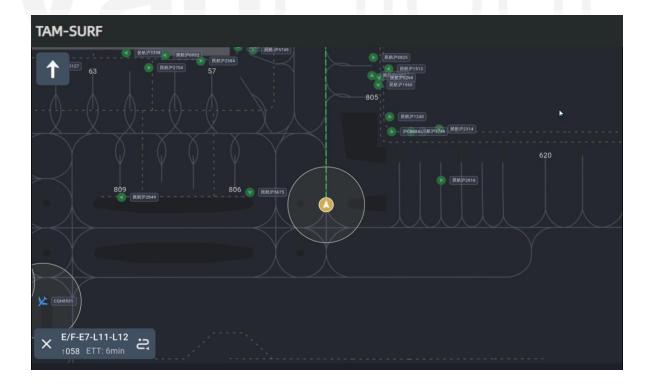
xx AIR, ZUUU ground taxi via hotel one right turn charlie then bravo senven make one eighty, U turn to bravo, right turn bravo six then left turn alpha.hold short bravo two, give way to xxx air, which is boeing 737 from tango tree. then continue alpha to alpha one, brovo, hold short of holding point hotel papa five, contact east ground one two one decimal seven five five.

then continue mike, delta, echo one hold short of runway zero two right and contact tower one tree zero decimal tree five, good day.



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right and contact tower one tree zero decimal tree five....

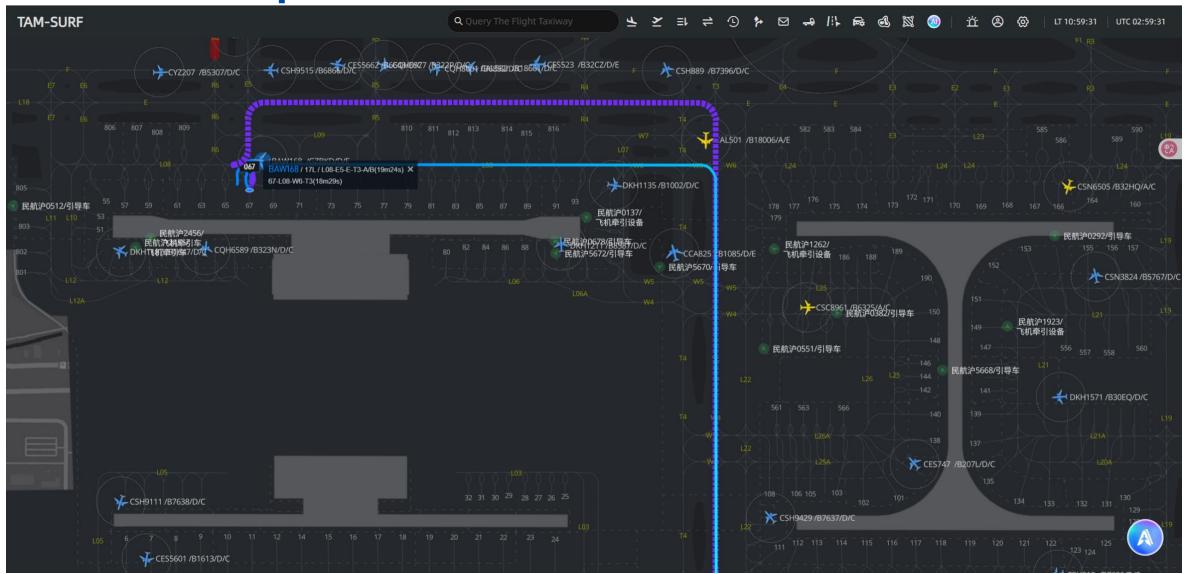


Enabling Support for Autonomous Vehicles

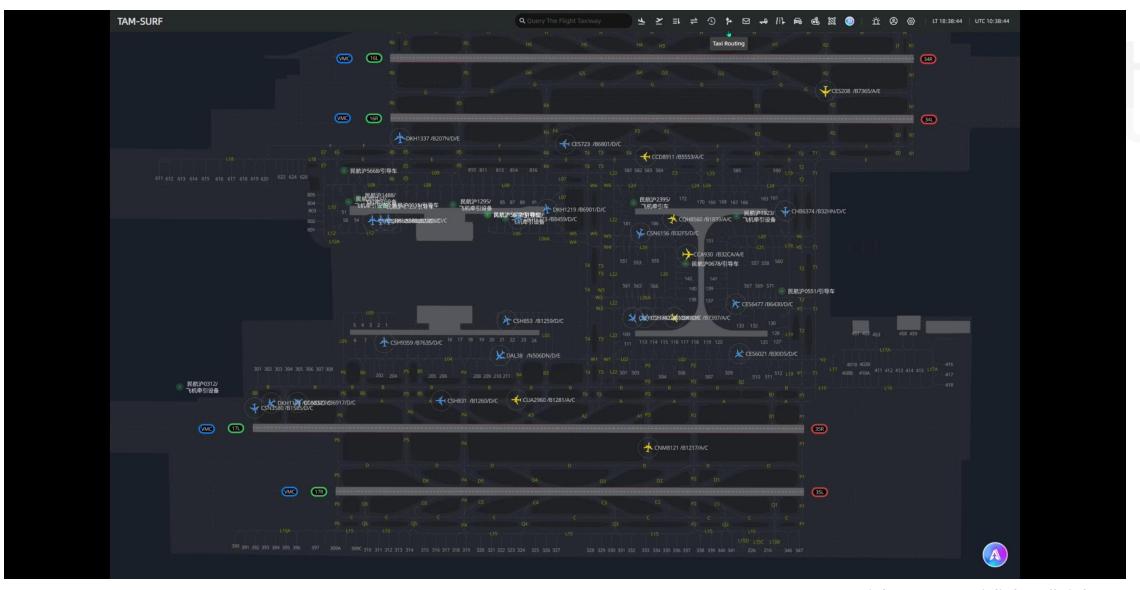




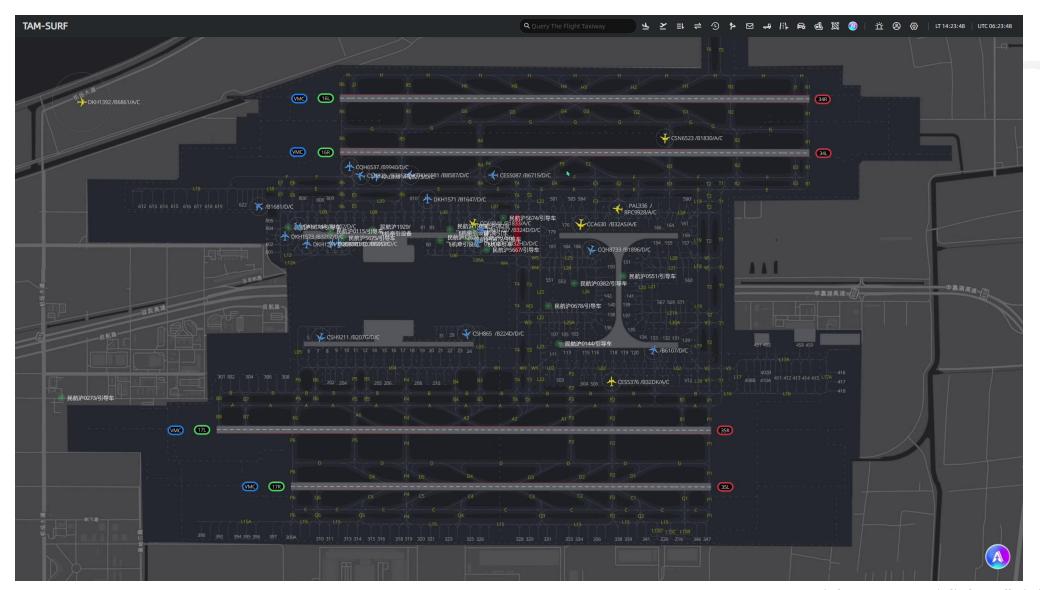
Taxi Route Optimisation



Alerts for Safety Conflicts and No-Go Zones



Aircraft Taxiing Surface Heat Map

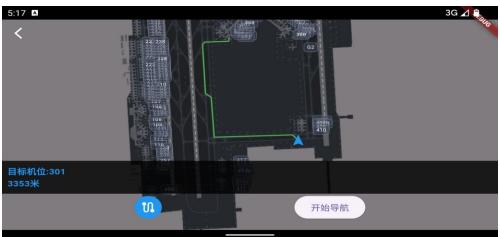


Connecting Aircraft and Autonomous Vehicle Systems











Value Matrix: Multidimensional Benefits from TAM

Value Dimension	Specific Outcome	Key Metrics / Description	
Operational Assurance	☑ Enhanced Safety Margin	Reduced ground conflict; Improved emergency responsiveness	Ö
	✓ Improved Operational Efficiency	Shorter taxi times; Reduced departure/arrival delays	Φ
	☑ Higher Temporal Precision for Flight Handling	Accurate pushback, taxi, gate-in/out; Enabler for TBO	Ö
Service Capability	☑ Increased Value of Scarce Resources (runways, taxiways, stands, etc.)	Higher throughput per unit resource; Peak-hour optimization	*
	☑ Enhanced Stakeholder Service Capacity	Better support for airlines, ground handlers, and coordination	8
Cost & Sustainability	✓ Lower Operating Costs & Carbon Emissions via Taxi Time Reduction	Reduced fuel burn and CO ₂ ; Green airport operation	۵
	✓ Labor Cost Reduction via Autonomous Vehicle Deployment	40–50% reduction in ground vehicle drivers	•

SUMMARY & RECOMMENDATIONS

Summary

 Digitalisation: A-CDM uses digital technology to give airports access to a wealth of essential foundational data.

- Agents: TAM applies intelligent technologies to build specialised Agents that tackle complex problems, continuously improving airport safety and efficiency by enhancing human expertise.
- SWIM/DataSpace: Agents rely on large volumes of real-time, accurate data; advanced data exchange and transaction technologies are needed to connect Agents with the data they require seamlessly.

Recommendations

TAM is one of the ASBU Blocks where AI Agents can be implemented earliest. We hope to -

- Encourage more countries to enhance airport digitalisation through A-CDM.
- Promote the development of SWIM by focusing on practical application, upgrading data exchange and transaction technologies with reference to DataSpace concepts.
- Encourage the civil aviation industry to start applying AI technologies, including AI Agents, as soon as possible.

FUTURE

TAM

Digitalisation + SWIM/DataSpace + Agents

VariFlight[®]