IATA DRONES
INNOVATION WEEKEND

CHALLENGE #1

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The Aviation Cloud

Data Exchange for all Users

The pace at which the Unmanned Aircraft System (UAS) industry is growing is unprecedented. It is anticipated that in 2035, at any given hour we will have over the skies of Paris 156 commercial aircraft, 2500 urban air mobility vehicles, 16667 drones delivering cargo, 58 inspection drones, and 44 hobby drones[1]. The commercial UAS market in the USA could triple in size by 2023[2]. There are already plans for urban air mobility; the transport of cargo over the last to medium mile; cross-border operations; and connecting multiple cities via UAS. This means that identification, tracking, and traffic de-conflicting using data and AI are critical for a sustainable air transport. The question becomes how do we move from a centralized air traffic control system to a de-centralized air traffic management architecture that is based on data exchange and cloud-based solutions? This evolution in traffic management could require fully automated systems for flow management and system wide information management system that are inclusive of unmanned aircraft. Challenges that we foresee include; cyber threats, data governance, monopolistic business models, and legacy systems.

Considerations
- Free flow of information amongst trusted users
- Highly automated system able to handle growth in manned and unmanned traffic
- New types of service providers and airspace users
- Performance based regulatory framework
- Framework to test new technologies in real live environments

Challenge

Your project is to propose a conceptual model of data exchange between UAS and the Traffic Management System (ATM or UTM or both), specific for the operation of automated VTOL taxis, referred to as "u-taxis, including:

1. A preliminary functional illustration of the data exchange model, its protocols.
2. Baseline provisions/requirements for information sharing/exchange.
3. Information governance structure and any need for regulations/standards.
4. Required infrastructure and technology to enable the data exchange.
5. Information exchange requirements in support of UAS identification, tracking and geofencing capabilities.
6. Data exchange capabilities with existing airspace users.
7. Cyber threat mitigation measures, including a scenario of a cyber-attack or system anomaly and the containment thereof.
8. Impact on existing aviation infrastructure.

[1] Source: Airbus
[2] Source: FAA

References

1. ICAO SWIM Concept
2. ICAO UTM Framework
3. GMSA Publication: Using Mobile Networks to Coordinate Unmanned Aircraft Traffic (https://www.gsma.com/iot/wp-content/uploads/2018/11/Mobile-Networks-enabling-UTM-v5NG.pdf)
4. GSMA Publication : Mobile Enabled Unmanned Aircraft (https://www.gsma.com/iot/wp-content/uploads/2018/02/Mobile-Enabled-Unmanned-Aircraft-web.pdf)
5. EASA regulatory framework: https://www.easa.europa.eu/easa-and-you/civil-drones-rpas/drones-regulatory-framework-background
6. SESAR JU U-Space blue print: https://www.sesarju.eu/u-space-blueprint
7. SESAR JU roadmap for integration of UAS: https://www.sesarju.eu/sites/default/files/documents/reports/European%20ATM%20Master%20Plan%20Drone%20roadmap.pdf
8. JARUS: http://jarus-rpas.org/
9. Airbus UTM Blue Print: https://www.utmblueprint.com/