CASE STUDY

Drone Traffic Management

WHO WE ARE

The Connected Places Catapult (CPC) is an independent, trusted, expert broker operating at the intersection between the public and private sectors and between local, regional and national decision making. We promote UK innovation and broker relationships between government, academia and industry providing support and solutions for innovators to commercialise their projects and research. With our deep expertise in technology, we bridge the gap between buyers, suppliers, innovators and industry. Our agile approach enables us to convene our partners to act rapidly to create new market collaborations responding to public funders and industry needs. We boost demand for innovation to unlock wider economic and environmental benefits.

Collaboration to develop UTM that works for everyone

Challenge

Today's national air traffic management (ATM) framework is designed for manned aviation and cannot accommodate unmanned aircraft due to the gaps in infrastructure necessary to coordinate the movement or aircraft, keep aircraft separate and help avoid collisions. Therefore, drone operations in the UK are limited to line of sight flight or must be confined to specific airspace by a restrictive authorisation process conducted on a case-by-case basis. Thus, the lack of an effective traffic management system represents a barrier to the growth of the industry.

The next generation of traffic management will take advantage of advances in automation, digitalisation and connectivity resulting in a data-rich and service-driven ecosystem which will be built using large-scale IT infrastructure expertise not dissimilar to that needed to create technologies behind Netflix or Amazon Web Services. This will create challenges on electronic identity, data protection, cyber security and safety of automated services. To enable this new infrastructure will require the Civil Aviation Authority to ensure that the industry meets the highest technical and operational safety standards.

Solution

The Open-Access Framework for UAS Traffic Management (UTM) addresses many of the airspace integration requirements for drone operations. It is the outcome of two years of partnership between DfT, CPC and the resulting in a market-focussed solution that will ultimately enable the industry to capitalise on the opportunities presented by drones. UTM is a digital traffic management system of a networked collection of services which communicate with each other based on a common framework or rules. It is widely accepted that a UTM system must enable:

- the ubiquitous awareness for drones and of other airspace users
- awareness of airspace restrictions
- identify and resolve conflicts with drones and other aircraft
- interface with ATM to access segregated airspaces.

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Solution

The programme has taken a phased approach to ensure each step was reviewed and had consensus with the industry.

Phase 1: Stakeholder workshop and survey to capture the UTM landscape, stakeholder needs and concerns to help drive preliminary design decisions and to develop acquisition intelligence to inform initial procurement decisions.
Phase 2: CPC partnered with key UK and global UTM stakeholders to design the Open-Access UTM framework including the roles and responsibilities, architecture and services. This phase also created an initial roadmap aimed at test and evaluation of the UTM capability.
Phase 3 (In-progress): In 2020/21, CPC will lead a CR&D project to develop, build and demonstrate the Open-Access UTM framework for drone operations below 400ft.

Stakeholder engagement

The development and implementation of a national UTM system requires the input of many stakeholders to help build consensus on the market needs, operational requirements and regulatory compliance. As with any large-scale technology development project, CPC has worked with many aviation stakeholders to capture and implement these into the design of UTM. Key stakeholders include DfT, the CAA, NATS, UTM companies, Airports, Drone Trade Body, Innovate UK, Universities and drone operators. Over the three phases of the programme, stakeholders have participated in the project and provided feedback on the research outcomes following each phase.

Outcomes

Following the completion of each phase of the programme, CPC consulted with the industry to gather feedback and published the findings in public-facing documents to inform the industry of outcomes.

- Enabling UTM for the UK. May 2020 [Link]
- Towards a UTM System for the UK. October 2019 [Link]

The programme has also worked with the UK CAA to capture regulatory requirements and has been able to inform a key CAA guidance on the use of UTM for BVLOS operations.

- A Unified Approach to the Introduction of UAS Traffic Management. UK CAP 1868. Dec 2019

CPC creates value

- CPC is able to leverage its independence and industrial knowledge to convene projects, to build consensus and get more out of partnerships to help create market focussed UTM solutions which will ultimately help grow the drones market.
- CPC captured the market and industry needs into a design solution and provided actionable data to DfT and the CAA to help inform policy and regulatory decisions.

Benefits

CPC has built strong partnerships across government, industry and academia which enable us to identify and leverage expertise whilst providing strategic leadership across the project. This has helped us build consensus on UTM and get more out of partnerships while remaining neutral.

Next steps

There is a need to create greater awareness of the Open-Access UTM framework and allow industry to build on it to help unlock the drone services market. The CPC will continue to work with project partners to help maximise impact by sharing actionable data about communications solutions and software building blocks for UTM. This will help with adoption of the Open-Access UTM Framework as the starting point for airspace integration and UTM initiatives such as the Future Flight Challenge. The framework's federated architecture will enable engagement with existing and new aviation business and allow the industry to focus on creating new innovations and value-added services rather than developing uncoordinated solutions for traffic management.

CPC will also continue to work with the CAA and industry to promote the use of drones and will continue to disseminate learnings through the Government Drone Pathfinder website. *https://cp.catapult.org.uk/case-studies/pathfinder/*

To find out more about the Connected Places Catapult and how we can help you develop the future skills that address the needs of your organisation please contact ***info@cp.catapult.org.uk***

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