

How to develop professional applications for drones?

Alcimed, a consulting company specialized in innovation and the development of new markets, is looking into the growing use of drones for professional applications and the obstacles and levers for their development.

Toulouse, January 09, 2018 - Over the past 5 years, the market for professional drones has continuously been growing. However, the actual market size is still far from that predicted by growth estimates.

A developing market hampered by regulations and system reliability

The drone market for professional applications went through a phase of massive expansion and investments between 2015 and 2016 but by the end of 2016 and the beginning of 2017, many players fell into financial difficulties due to major investments into a market that did not grow as expected. Today, the **time has come for consolidation**, both by the restructuring of various stakeholders (takeovers of Azur Drones operators, etc.), and by the scale-up of established applications (earth observation in agriculture, etc.).

One of the main obstacles facing the drone industry is the **limited systems' reliability**. Willingness to reduce costs, lack of strict certifications and requirements, as well as the goal to reduce device weight for extended autonomy all cause manufacturers to create extremely simplified systems. As a result and unlike in aviation, redundant systems and reliability improving design optimizations are rare. "For the same application, we observe a much higher accident rate with drones than with light aircrafts" adds Alexandre Savin, director of the Alcimed office in Toulouse.

This lack of reliability limits the evolution of regulations, which are often stated as the main obstacles for drone application development. The first regulations focusing on the professional use of drones were introduced in 2012, and have recently undergone significant changes, related to the authorized maximum drone weights and the level of autonomy left to the systems in out-of-sight scenarios.

Drone traffic management, an essential lever for the continuing development of the industry.

Like in commercial and general aviation, the increasing use of drones will only be possible with a thorough traffic management system. Such a system would ensure the **safety of flights and people** in terms of a growing risk of collisions, but also open the door to **new applications**.

The drone traffic management system (sometimes called UTM "UAV Traffic Management" in the US) should allow permanent geo-localization of all drones in flight as well as ensure the "deconfliction"¹ of their trajectories. From a practical point of view, this function could be assured by the use of a GNSS chip² and various embedded sensors.

The implementation of **such systems is of big interest not only to a large number of internal stakeholders**, including **drone operators**, interested in flight safety and new applications, but also **external stakeholders (non-operators)** such as law enforcement agencies, prisons, security services at sensitive sites (nuclear power plants, etc.), airports, airlines, general aviation, etc.

Several traffic management initiatives are currently being studied, particularly at the international level (ICAO³), in the United States and Europe, but also in other areas such as Dubai. In Europe, the EASA⁴ published a document in 2017⁵ in which apart from setting basic rules, they divide drone operations into

¹ Separate the conflicting trajectories of two drones or a drone and an aircraft, either actively ("turn left") or passively ("you have a conflicting trajectory with X coming from such a direction, please change trajectory")

² Global Navigation Satellite System

³ EASA: European Aviation Safety Agency

⁴ ICAO: International Civil Aviation Organization

⁵ <https://www.easa.europa.eu/easa-and-you/civil-drones-rpas>

three risk levels. In addition, by 2019, SESAR JU⁶, an initiative from the European Commission, aims to create a **roadmap for the development of a unified Europe-wide drone traffic management system**, called U-Space.

Although today there is a consensus regarding the need for a structured drone traffic management, it is very likely that the exact modalities will be continue to be fiercely debated in 2019-2020.

Developments lead to the emergence of new applications

The removal of technical and regulatory barriers could lead to a rise of new applications for light drones (less than 25kg). A potential one being parcel delivery, which is currently being tested worldwide by both private players such as La Poste or Amazon, and public institutions such as universities⁷.

For heavier drones, one of the main applications could be passenger transport, with first prototypes yielding very promising results. Nevertheless, the dream of seeing autonomous cars flying above our heads is still far from being realized... To date, regulatory authorities are not ready to allow autonomous vehicles to fly and transport individuals above inhabited areas.

Therefore, it seems that the first **high-capacity carrier drone applications will be developed outside cities**, possibly in the field of agriculture, a sector in full transformation where drones have already proven their value. Future applications in the medium term could be autonomous drones used for seeding and fertilizing.

ABOUT ALCIMED - www.alcimed.com

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⁶ SESAR JU : Single European Sky ATM Research – Joint Undertaking, <https://www.sesarju.eu/u-space-blueprint>

⁷ Cooperation between National University of Singapore (NUS) and Airbus Helicopters within the Skyways initiative