



# THE AGE OF THE DIGITALLY ENHANCED HUMAN WORKFORCE



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## IN MY OPINION

# Flying Smartphones—Making the Drones in our Skies Productive and Safe

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Will the drones in our skies become as commonplace as the smartphones in our pockets? Given the numbers of drones sold, it is a question that demands answers from all stakeholders. Drones already have multiple applications in industry, construction, agriculture, or forestry management, but especially in the police and fire and rescue services. Nevertheless, drones can bring in real benefits and become commonplace only when they can operate beyond the visual line of sight (BVLOS) of the operator.

Until now, it was uncertain as to how this form of operation could be achieved productively and above all safely. How can this new technology be fully exploited while maintaining the high safety level that exists at the core of manned aviation? The German air navigation service provider, DFS Deutsche Flugsicherung (DFS), and the German telco, Deutsche Telekom, have provided one crucial answer; deploying a technology already familiar to billions across the globe.

### Invisible to Conventional Radar

Drones have developed into a true mass market in the span of a few years. In Germany, as in other European countries, there are no reliable figures on how many unmanned aircraft systems (UAS) are currently moving in the airspace. DFS

estimates that there are about 500,000 drones used in Germany alone.

Drones pose various risks—especially for manned aviation. Unlike most commercial aircrafts, drones do not actively transmit their location and are too small to be picked up by radar. This is why DFS and Deutsche Telekom joined forces in a research project named Connected Drones. Our aim was to use the mobile network for locating drones so that they can be integrated into the airspace, safely and fairly.

### A Flying Smartphone

In essence, the drone becomes a flying smart phone. Using a special modem and a SIM card, the drone connects to Deutsche Telekom's mobile network and transmits its exact position. These data are sent to DFS and displayed in the UAS Traffic Management system (UTM). As the majority of today's mobile networks are optimized for ground usage, we started testing our mobile network intensively to prove that it worked for the needs of UAS. Surprisingly, coverage and link quality were far better than expected, although we experienced some challenges in handover and interference. In short, to handle the load of millions of connected drones, creating a dedicated network layer for UAS



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is mandatory. Given the number of drones out there, we see LTE networks as being sufficient and with the upcoming 5G roll-out, we also see considerable space for technical optimizations for UAS.

### A Clash of Cultures

The different philosophies of aviation and telcos became apparent during the project. Telco companies have an evolving system and always build and expand infrastructure according to existing needs, whereas in the aviation sector, safety is the top priority. This leads to a very different design and implementation philosophy; solutions are designed to meet 120 percent of requirements, they are intensively tested, and when it is all there and proven, switched on. The team-up phase was therefore a very intensive and instructive experience for our entire project team.

This clash of cultures also describes the phenomenon of drones very well. Due to their operational characteristics, they are part of aviation, which has always had to be very conventional and is characterized by slow and considered innovation leaps. Technologically, however, drones are more similar to the smart phone market, both exposed to disruptive and fast-moving trends.

### Enabling Business

During the common project, our focus was on testing with real customers in real networks and environments, instead of isolated sandboxes. Using this approach, we found that many companies already have ready-made concepts in the drawer of how to integrate drones into their daily operations, but lacked the operational and safety concepts with which they could do so.

This was our starting point. In May 2019, we successfully transferred the Connected Drones project to a new business, Droniq GmbH, a joint venture between DFS and Telekom. There are already several UTM projects in Europe, but with Droniq is the first company to enter this still very new UTM market.

### An End-to-End Solution

Our technological and conceptual approach is unique in the whole Europe. With our UTM, we offer an end-to-end solution for drone users—from flight preparation and planning to implementation

and evaluation of the flight. We use the mobile network for the control link, transmission of the drone position, and transfer of payload data, such as videos, pictures, or other sensor data.

### Full Integration Across the Business

Our vision is to become the digital platform for UAS in Germany. We believe that drone deployment is only safe and effective if it is cleanly integrated into all other business processes. The market is demanding a pragmatic, simple approach and Droniq intends on delivering exactly this. At present, we are still experiencing regulatory uncertainty, but we do not want this to stop us. It was a conscious decision by DFS and Telekom to serve this market by founding Droniq before the exact regulatory requirements had been fully fleshed out. In addition, drone technology is developing so fast that there is no time for the complex standardization processes common in aviation.

We are also aware that the technology competition for the tracking and identification of UAS has not yet been fully fought out. We are fully committed to mobile technology, but there are also other ideas that focus on satellite navigation (ADS-B) or Bluetooth. I believe that only a solution that neither excludes certain user groups nor is so complicated to prevent user participation will prevail going forward.

### Familiar, Trusted, Safe

Mobile technology is already a standardized technology for data transmission and identification of terminal devices used globally. The idea of turning drones into flying smart phones is gaining acceptance today. Since the launch of Connected Drones, I have been a member of a GSMA working group on drones, where we started with three telcos and now we are 44. Now it is up to the telcos to convince the UAS manufacturers to integrate the mobile technology for positioning directly into the devices. By using eSIMs natively on the drones, we can usher in direct, real-time interactions and updates on the drone's position with the flight computer systems of the UAS.

### A Mass Market Needs a Mass-Market Solution

Drones are clearly a mass market, unlike manned aircrafts. There are only around 20,000 conventional aircrafts currently registered in Germany, including commercial aircrafts, helicopters and private jets. On the contrary, there are millions of drones. Manned aviation has always had high entry requirements but almost anyone can buy a drone and fly it. This means that I also see a social change in aviation—it almost amounts to democratization.

For me, this means that our technological response must be suitable for the masses, scalable and as simple as possible. I am firmly convinced that at some point the commercial BVLOS operation of drones will be as commonplace as using a smartphone today. **CA**