After attending many Airth events in the past, I only recently started to contribute to it, as a member of the Council of Scientific Advisors. I gladly accepted the invitation to write an editorial so that I could share with you an issue that is close to my heart - the impact that unmanned aircraft will have on the world, both inside and outside aviation. I am not referring to military Unmanned Aerial Vehicles (UAVs) used for surveillance, communication relay and attacks on ground targets, but to Unmanned Cargo Aircraft (UCA) and unpiloted passenger planes (more on 'unpiloted' later).

While there will definitely be a near-term shortage of air travellers prepared to risk life and limb in unmanned passenger aircraft, 'unmanned' offers important advantages for cargo transport. Savings on salaries are perhaps the least significant, although one ground controller can control ten or more UCA en route. Because there is no crew on board, a UCA can take days to reach its destination, flying at a speed optimized for efficient and environmentally friendly turboprop engines, above most weather but below congested airspace used by today’s airlines. Even if a direct trip from an emerging economic region in China to consumers in Europe takes a day, this may well be less than transport via hubs. And direct flights on thin routes are where UCA should excel, since the advantages of 'unmanned' manifest themselves particularly in small aircraft. For example; since most freight can fit in containers limited in height, a ‘flying wing’ or Blended Wing Body (BWB) layout is possible. The absence of a fuselage can reduce drag by 15-20%. In manned aircraft, the need for a cabin height of 2 meters or more requires a large wing to provide an efficient thickness-to-cord ratio. Furthermore, UCA may not need pressurized cabins, merely conditioned containers for some types of cargo. This saves weight and eliminates the need for a circular cabin, again making a BWB configuration possible.

Another example of the advantages of UCA concerns productivity. Because there are no crew to be scheduled, a UCA can fly to a destination, pick up cargo, fly on to the next destination and so on, and only return to its home base for maintenance and the like. Empty return flights and rejection of loads because of scheduling issues can be largely avoided.

Because of the advantages of 'unmanned' for smaller aircraft, UCA have the potential for unlocking the economic potential of areas with inadequate infrastructure or with limited volumes of cargo to be transported. If these areas are hundreds of kilometres from hub airports, UCA may be used to transport cargo directly to customers over intercontinental distances. The Internet made exchange of information from everywhere to everywhere possible, perhaps UCA can do the same for small volumes of cargo. Smaller UCA will probably be the first unmanned cargo aircraft in commercial use. Unmanned competitors of the Boeing 747 are expensive to develop and probably cannot compete with passenger aircraft carrying belly freight. The market for dedicated large cargo aircraft is too small for a UCA having to compete with cargo versions of passenger aircraft.

The development of UCA is an opportunity for industry. It represents a new class of aircraft, giving, for example, small but innovative enterprises the chance to become primes, like the American company General Atomics managed to do with the Predator military UAV. Organizations represented in the Dutch Platform for Unmanned Cargo Aircraft (PUCA) aim to expand on their strengths in airframes, system integration and logistics.

I see a great future for UCA, but there will never be an unmanned replacement for large passenger airliners. There always has to be a cabin crew on board, for serving passengers and to assist in, for example, evacuation in case of emergencies. But precisely the presence of a cabin crew may make pilots redundant. Flying a plane can be done from the ground, but in case of trouble you may need 'ears and eyes in the plane'. A specially trained cabin crew member can fulfil that need, providing information to the 'pilots' on the ground. He or she can also take certain 'strategic' decisions, like whether to divert in case of a passenger falling ill.

Will passengers ever accept pilotless aircraft? If UCA prove safe, if a cabin crew member is in command of the aircraft and if pilotless flight brings benefits like lower ticket prices, who knows? Automation is everywhere; people are getting used to unmanned people movers and trains, cars can park themselves in tight spots. It is up to engineers and scientists to make the future possible. I sincerely hope that Airth will play a part in the development of unmanned aircraft, which, I am sure, will shape the second century of aviation like manned aviation did the first. Aviation was, and perhaps is, seen as an icon of technical sophistication, of modernity, of the conquest of nature by man. But it is as much a consequence of progress as it is a cause. Apart from the raft of technologies needed to make an aircraft fly, organization is an essential ingredient.

Organization of research - from 1932 onwards, more patents were taken in the USA by companies than by individual inventors. Organization of production, of aircrew training, of air traffic management, of maintenance and oversight. Modern times are times of organization, and few activities lend themselves better for organization than air transport. The air is about the only place where the shortest distance between two points is a straight line. Nowhere is standardization more feasible than in air transport. This makes the air a natural medium for unmanned transport, much more so than terra firma. It may well be that, in order to make air transport even more efficient than today, pilots have to be organized out of their aircraft.

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