# What if your shopping was delivered by drones?

With the proliferation of drones and their capacity to increase the efficiency and precision of multiple tasks, in what ways could they become a driving force for the European economy and society?

Known as Remotely Piloted Air Systems (RPAS) or Unmanned Aerial Vehicles (UAVs), drones have become increasingly present due to a sharp drop in production costs, as a consequence of recent innovations in light-weight materials, on-board computers, batteries and fuel tanks. Since their inception, drones have been developed for military purposes, with the inclusion of weapons in them, as well as for surveillance and policing efforts. Recently, however, other uses have proliferated, in the fields of climate data collection, scientific exploration, 3-D mapping, infrastructure maintenance, logistics and delivery services, professional photography and filmmaking, entertainment, wildlife protection and agriculture. The increasing diversity and affordability of drones will surely lead to their widespread use amongst corporations, governmental institutions and common citizens. Thus, the legal and ethical issues already associated with drones will most likely become more prominent and require the attention of European policy makers.
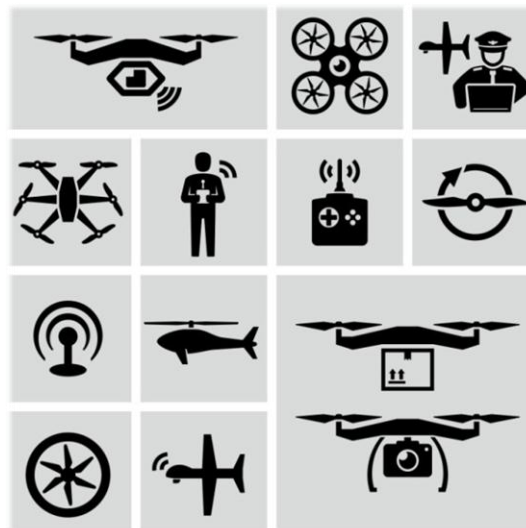
Expected impacts and developments

In the immediate future, drones are likely to be used by both military and civilian authorities in discharging core duties of safety, security and policing, particularly in carrying out surveillance and intelligence gathering. The immediate impact of this will be to reduce the number of 'frontline' personnel being deployed in carrying out these activities. Another consequence will be the increase in unauthorised breaches of nations' airspace, as has happened recently in the Ukrainian conflict or in France, close to its nuclear plants. In the near future it is expected that drones will be carrying out the most dangerous of activities, such as assisting in fire-fighting or natural catastrophes.

The range of commercial applications for drones is yet to be explored. Major delivery and logistics companies have already started investigating the ways in which drones could improve the efficiency of their operations. Predictions are that 12% of a $98 billion cumulative global spend on aerial drones over the next decade will be for commercial purposes alone. This could imply that by 2050 there could be as many as 150,000 drone-related jobs in Europe. Drones are already being used in areas such as infrastructure maintenance, where they can be extremely useful at reducing time, costs, personnel needed and effort in routine inspections and reparation procedures of public transportation, highways, railways, mining complexes, factories, pipelines, oilrigs or even private vehicles and households. As for their scientific uses, drones are already of great help in the work of archaeologists, speleologists, biologists and meteorologists.

One of the areas in which drone use has the greatest potential is agriculture. There are enterprises already working on the multiple possibilities of involving drones in the different aspects of farming. Drones could be used to collect all sorts of data from the field without having to spoil part of the land with the use of heavy machinery. They will be able recognise if there are any sorts of diseases, parasites or animals hindering the production, and once they have located and identified the problem they will be able to eradicate it themselves with the use of the appropriate measures, never interfering with the crops which are left in good shape. Moreover, drones will be able to record information on all sorts of variables so as to make the irrigation and fertilization processes more efficient and cost-saving.

What are the unexpected impacts that could arise if drones became embedded in society?

If drones were to proliferate in the near future and their use became widespread, what impact would that have on privacy? With the increasing capacity of drones to collect all sorts of data, it is possible that they will be used by corporations or government agencies in uncontrolled and unlicensed ways. It has been noted that the lack of transparency regarding who is the operator of a drone and for what purposes it is being used can create a 'chilling effect' in citizens. Could this have implications for how citizens behave in public if they feel watched by drones? It is not only privacy, but the freedom to express one's identity and to choose how one is presented to the world that are at stake here.

The use of drones in delivery of commercial goods and services would imply the presence of huge numbers of aerial vehicles occupying urban areas. Therefore, safety issues regarding accidents must be taken seriously: drones could collide with buildings, people, other drones and other types of aircraft or ground vehicles.

In terms of the use of drones in agriculture, it could transform both the job market and the required skills in the sector. Indeed, it is important to consider how the new skills and knowledge that will be needed to design, operate and maintain both drones and related infrastructure can be made available to the increasing number of people drawn to this technology. We might also consider the possible uses for drones in criminal activities. For example, in the illegal drug market there is potential for drones to become prevalent as they are hard to detect and even if they were intercepted no individuals would be brought to justice. Another interesting option to consider is how drones may facilitate the lives of people with mental or physical disabilities. The EU and its Member States must provide the appropriate financial support for the development and affordability of drones that can be used to ease the lives of those with greater difficulties.

Anticipatory law-making

Whilst many concerns may be similar for civil and military parts of society, it should be noted that Member States would be expected to retain regulatory powers over drones used for military or defence reasons under their remit of competences. In terms of civilian use, there are several issues for policy-makers to consider. The EU has already legislated with regard to data protection, but it will face challenges when trying to ensure that this legislation is effectively implemented if the number of drones keeps increasing exponentially in the next few years. The principles for an adequate data protection are: notification, consent, proportionality, data minimisation, purpose limitation, data security and the right to access, correct and erase data. One way to reduce the public concerns about privacy is the creation of a website or mobile app that can inform any citizen about the drones that are flying in his area. It should provide information about the drone's mission, the type of data it is retrieving and who is responsible for it. If drones are used in farming for carrying and releasing chemicals, this should be adequately regulated.

Private enterprises, user associations, national vehicle and transport regulatory agencies, air-traffic management institutions and other stakeholders all agree that legislation at the EU level is urgently needed in respect to drones. The classification of aerial norms in terms of the height of the flight or the weight of the vehicle is outdated and a new form of regulation is needed that is based solely on the type of aerial vehicle. Moreover, harmonization at European level of regulation involving drones is required in order to facilitate the creation and growth of a single European market with equal conditions for all competitors. However, due to cultural differences between nations in terms of how drones are perceived, this harmonization must set common standards and rules but allow for variations within them for each Member State to decide upon. The recent Riga declaration on Civil Remotely Piloted Aircraft Systems (RPAS), supported by EC representatives, agreed that the best way to achieve the common objectives of all stakeholders involves the following principles: 1. Drones need to be treated as new types of aircraft with proportionate rules based on the risk of each operation. 2. EU rules for the safe provision of drone services need to be developed urgently 3. Technologies and standards need to be developed for the full integration of drones into the European airspace. 4. Public acceptance is key to the growth of drone services. 5. The operator of a drone is responsible for its use.