DOUBRE Maxime

Written Exam Questions – M1

All questions relate to the product or service chosen for the oral presentation.

1) Explain the origin of the product or service, including the reason behind its development.

At the origins, drones were concepted in 1996 and the first flight of a drone was in 1997. Drones result of a project funded by the army of the United Kingdom in 1916 during the first world war but they didn't find interest in drones.
The delivery by drone came back in 2013 with amazon even if it had already been tested by the army without having any date about it.
During this last 10 years, the cost of components falling, size of components decreasing and compute power increasing, there was a drone boom.
New technologies have grown in maturity and home deliveries too.
So, the concept of delivery drones has grown and become more present.
During global shortages drones can be very useful by delivering assistance.
Drones have been created by the army and developed by a lot of other companies since their creation.

2) Give the timescale and milestones of the project.

In 2013 Amazon announced that they were going to develop drone delivery drones but it's still unavailable.
In the same year, DHL tested a delivery side with drone from one side of the Rhin to the other and it was a success
In 2018, Japan has reunited 10 companies like Airbus, Boeing and Uber to accelerate the development of taxi drones.

3) What problems have been encountered so far, and how have they been overcome?

Drones are the sources of some problems.

Physical security is one of these and for this one, a lot of reliability tests are done in close areas before deploying drones in the city.

Computer security is a problem solved by the fact that there is no wire in drones, only a GPS card to allow the drone to know where he is in the city. With this way we are sure that nobody will take control of our drones.

In the same way, the gps card allows us to localize each drone if one of them is stolen.

Another challenge is the power of drones. To avoid a problem of battery each drone has embedded programs which make sure that if the battery is under 20% the drone will come back to the base to reload it. Each drone also has some sensors to be sure of the state of each component in the drone.

About the noises from drones, we can solve it by putting on each propeller which makes minus noises but the noise is something we can't totally stop.

The problem of the traffic is one of the biggest challenges we have and to solve it, each drone has sensors to know the position of other drones that he crosses on his way. It allows drones to avoid contact between them. We have also programs which change the itinerary if the drone detects a lot of others on his way.

The legislation about aircrafts is quite strict so drones can't fly in each area. The map of each drone is updated to forbid drones to go in controlled areas like the danger zone.
Another legislation is about the weight of drones but we have derogation for delivery drones so it's not a problem.

At this time drones can't wear any size of parcels. There is a limit about the size and the weight, otherwise drones can't wear it.

The last challenge we have with drones is that the weather is an important data because drones can't fly in each weather conditions. When the minimums are reached no drone can take-off to deliver something. We can't totally solve this challenge because it doesn't depend on us.

4) Why do you feel that this product or service is important?

Our service is important because it allow to have quicker deliveries.

We have the possibility to reach enclaved site with drones and deliver some stuffs for the population.

There is a big advantage which is the low pollution. Drones allow us to deliver as trucks or any other way to deliver but without the important pollution brought by today's vehicles. It should be a very good way to clean the earth while we continue to make deliveries.

5) In your opinion, what are the possible future possibilities for this product or service?

In the future we can imagine that delivery drones will be used in humanitarian missions after natural catastrophes or if populations are enclaved. Drones could allow the routing of provisions and medical stuff.
We can also imagine that one day delivery drones will be able to carry some people, like taxi drones.

6) While doing your research, what was the most surprising fact that you learnt?

The Delft University of Technology in the Netherlands has created the Ambulance Drone. The goal is to solve problems which are the causes of death in medical emergencies, such as cardiac arrest.

It's to be able to go to the scene in the first few minutes that are the most important for the victim, until the real ambulance and medicals crew arrives on site.

The drone is designed to arrive on site with first-aid kits, and video and audios sample to instruct someone nearby how to apply the first help with the first-aid equipment.