

Texas A&M University at Qatar
Electrical and Computer Engineering Program

ECEN 403
Senior Design Lab

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Project Proposal:

Emergency Drone

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**“On my honor, as an Aggie, I have neither given nor received
unauthorized aid on this academic work.”**

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1.0 Abstract

Nowadays everything is working with electronics devices. Having a drone to deliver items for people is very needed in this certain region. Therefore, we decided to communicate with the ministry of transport and communication to work together and enhance a drone that can benefit the country. It will be an emergency drone with the help of many well-known companies like ooredoo, ministry of transport and communication, ministry of interior, and Hamad medical center. The proposal will include the problem statement, project description, mythology, estimated budget and timeline.

2.0 Problem Statement

The country populations is increasing day by day due to the development that Qatar is facing. By increasing the population, traffic have become a problem as in such situations, it may lead to a loss of people lives. The drone will be able to not just deliver medicine, it will have an audio communication where we can live communicate with the injured patient. In addition, the drone will have a professional camera where the controller will have an overview of the unfortunate accidents and situations. This will benefit the hospital in case of accidents where they can estimate the number of injured people and send enough ambulances to their stations. In addition, in case of a car accident, this will benefit the ministry of interior to have a report of each situation faced daily.

The drone will also contain a hook that can pick and drop items. The delivery box will be designed to be secured where it may contain some medicines under room temperature that have to be delivered to certain people. The delivery box will also be easy to access, where for instance an injured person will be able to get the items easily from the box. By just knowing his/her location and what kind of medication they need.

3.0 Project Description

The drone delivery is under an autonomous system with 3G network that guide the location of the drone. The application of this particular drone is a medical aspect and it can help with security also.

3.1 Methodology

By the help of the ministry of transport and communication, we will take the delivery drone and manipulate on it. We are going to add several main features on it:

1. Voice communication: which will let the person to speak if he/she is in an emergency situation and have instructions if needed.
2. Camera: to figure out where the person location and have an overview of the situation. Then deliver the information to Hamad medical center.
3. Box: Designed a practical delivery box with a certain material. The box will be insulated and have the temperature controlled because some of the items delivered need a certain temperature.

The combines mass of 1, 2 and 3, along with the items they will carry should be approximately 5kg. Hence, the drone needs to have a PID controller which is tuned to keep the drone in the air once the load is suddenly released or picked up. The arm and box need to be designed such a way they are lightweight and can be operated via a remote control. The main function is to carry the first important items to minimize the timing distance.

3.2 Previous Finding and Research

The ministry of transport and communication have an autonomous delivery drone. This drone was used for a drone pilot project as they mentioned. In order to reach a good compensation project we need to have two main majors in this project. That is why we decided to have a mechanical students helping us with this project.

In the innovation lab, the engineers used advanced features and algorithm to have a safer drone. Also, the drone will be a reliable one due to the operation process. The ministry drone function with a high radio frequencies for a long or short radio controls. Then, the bandwidth frequency is measured by the pilot.

For the data flow, the information is operating over MAVLINK system for the drone. The analytical operations is by a computer and this allow the drone to flight at a certain height. Operating the drone under a 4G network have several benefits, as it remove distance limitations between each station. Also, confirm that the drone will fly at 200m and higher. Moreover, it allow the user to have a strong measurement.

3.3 Proposed Design

Here is the delivery drone that was taken by the ministry of transport and communication. This drone will be upgraded to be an emergency drone with the features listed below.

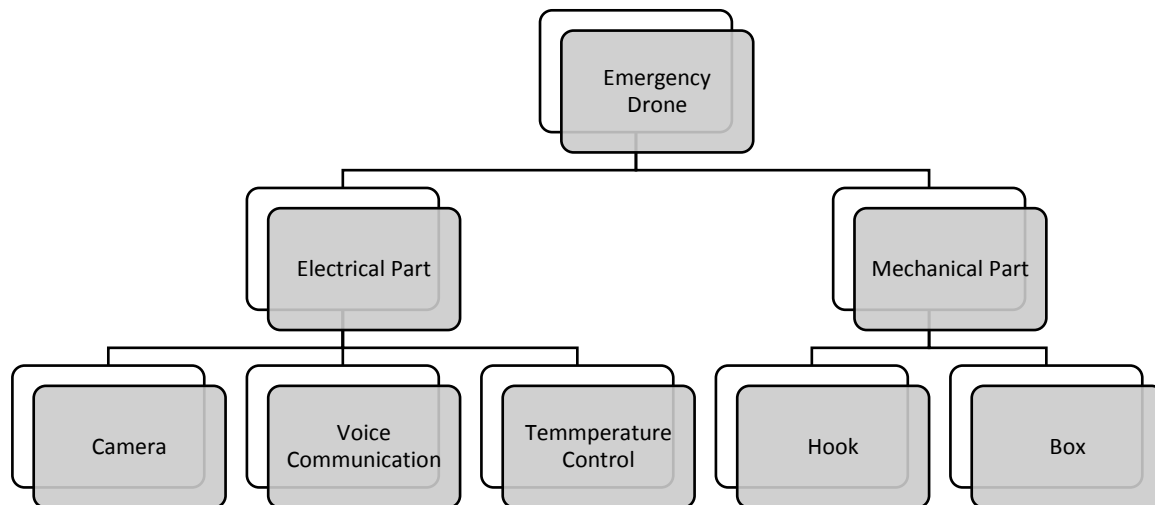


Figure1. Illustration of the emergency drone features.

4.0 Estimated Budget and Justification

To build the emergency drone, some items must be purchased. As shown in Table 1, the items needed are listed with their estimated price budget.

Item	Price	Quantity	Total
GoPro-Hero6	US\$499.99	2	US\$999.98
Speakers	US\$50	2	US\$100
Mechanical arm	US\$200-US\$300	1	US\$200-US\$300
Box Material	US\$300-US\$500	1	US\$300- US\$500
Hala sim card	US\$45 (per month)	1	US\$200- US\$400
Total Price			US\$2299.98

Table 1: List of Items to Purchase

GoPro-Hero6 was chosen where it is one of the best live camera in the market. The camera stream with 1080p and with HD 720p which as a high resolution. In addition, it has a 78 degree view for a suitable price. Hala sim card was chosen for the 3G from ministry of transport and communication. There is another approach to get a free sim card from ooredoo. The rest of the items were not chosen specifically yet.

5.0 Project Timeline

Month	August		September				October					November				December	
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Tasks																	
Project Proposal and Team Working Agreement																	
Submission of Project Proposal and Team Working Agreement																	
Project Proposal Presentation Preparation																	
Project Website Preparation																	
Customer Needs and Ethnographic Study																	
Benchmarking																	
Functional Modeling																	
Concept Generation																	
Progress Presentation Preparation																	
Final Presentation																	
Final Report																	

Planned	
In Progress	
Completed	

6.0 References

iLab Parcel Delivery by drone for QPost Project v1.5.pptx

Autonomous Vehicle Data & Design.vsd

InnovationLabDroneUseCase_moi.pptx

InnovationLabDroneUseCase_MME.pptx

<http://www.logitech.com/en-us/product/c922-pro-stream-webcam>