

MEDDRONE

A website to deliver medicine supply to remote and war-hit regions using drones



Link to the website: <https://2022csb1137.wixsite.com/dronedelivery>

PROBLEM STATEMENT

create a drone
delivery system to
deliver medical
supplies to remote
and war-hit regions



The idea is to create a website that allows users in remote and war-hit regions to choose a medical supply and location and send a request. The website will then send the request to the drone-centralised system, which will assign a drone to deliver the supply. The drone centralized system will also request the nearest medical store to send the supply to the drone centre via a conventional delivery method. The drone will then fly to the user's location using GPS technology and other sensors, deliver the supply, and return to the drone centre.

The idea also involves considering multiple centralized drone stations, so once all the stations receive the request, the station nearest to the user's location will accept it. This will reduce the delivery time and cost, as well as increase the availability and reliability of the service.

Drone storage

- The drone should have a secure and weatherproof cargo compartment to protect the medical supplies from the elements and ensure their safe delivery.
- The storage capacity of the drone should be sufficient to carry the required amount of medical supplies, including any additional equipment or supplies that may be needed.
- Some medical supplies, such as vaccines or certain medications, may require specific temperature control during transport. The drone should be equipped with temperature control mechanisms to ensure the supplies remain viable.
- The storage compartment should be easily accessible for loading and unloading of supplies, while also ensuring that the supplies remain secure during flight.
- The storage compartment should be durable enough to withstand the rigors of flight and potential rough landings, ensuring that the supplies remain intact and undamaged.

Access to this Delivery system

Our delivery system website will be available to resident of remote and war-hit regions, NGOs and Government. We will use AI algorithms to determine user authorization for implementing access control

- Using machine learning models we will analyze user credentials and permissions to determine if they are authorized to access the delivery system. Tools like TensorFlow, PyTorch, and scikit-learn can be used to train and deploy machine learning models for this purpose.
- Using rule-based systems to define access control policies based on user credentials and permissions. Tools like Drools and Jess can be used to create and manage rule-based access control systems.

AI-based Optimal Route Planning for Medical Supply Delivery

An AI system that can plan optimal delivery routes, taking into account factors such as weather conditions, airspace restrictions, and the location of medical facilities in the target regions is needed.

The AI system should also be able to adjust routes in real-time based on changing conditions. Our application can make use of popular tools like Google Maps Platform Route Optimization API, or the NVIDIA cuOpt AI for this purpose.



Delivery location

1. Users will input their desired delivery location using our map interface.
2. We will maintain a database of medical stores with their respective locations (latitude and longitude).
3. Using a geocoding service, we will convert the user's inputted location into geographic coordinates (latitude and longitude).
4. We will integrate an AI tool, such as the location services API available on WIX app market, to calculate the distance between the user's location and nearby medical stores. This will help us determine the nearest medical store that can supply the required medicine.
5. Our drone delivery system will be integrated with the AI tool to receive information about the selected medical store and the delivery location. This integration will be done using tools like IBM Watson Assistant.
6. Once the nearest medical store is selected, we will proceed with processing the order and arranging for the medicine to be supplied to the drone for delivery.

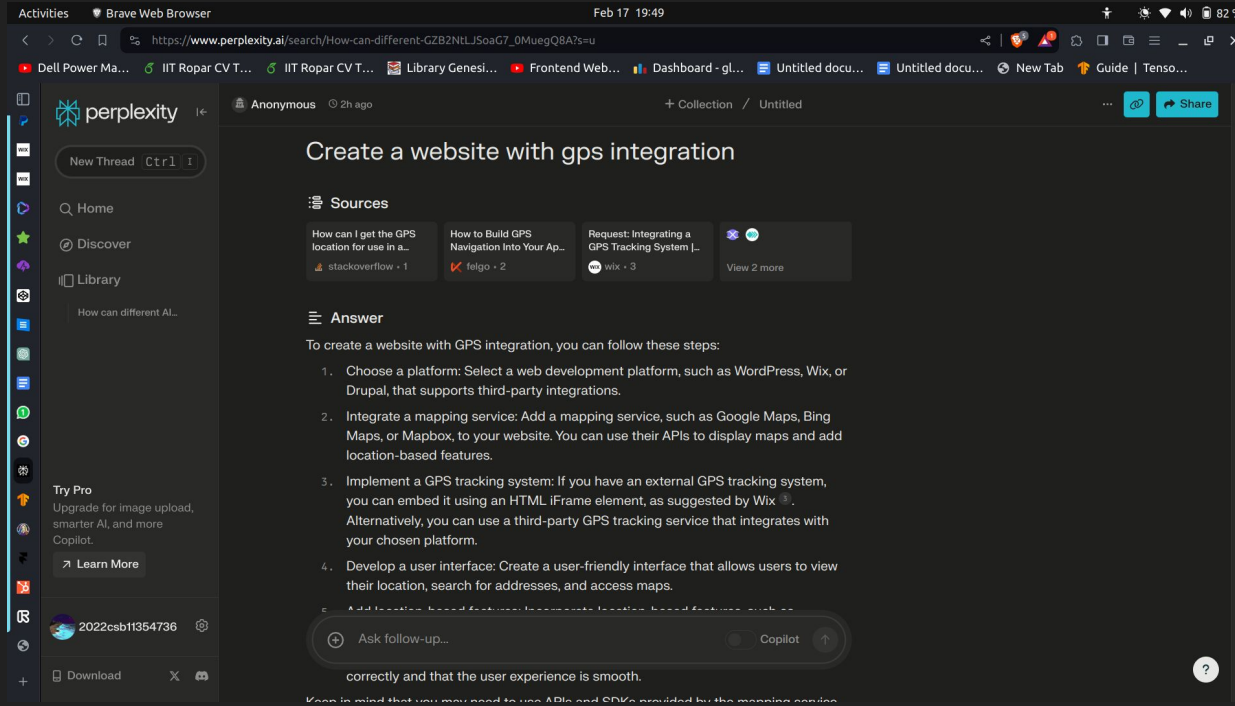
Challenges Faced along with the solutions

- In the remote and war affected areas, there is cut down of wifi and cellular network. We can tackle this challenge by using the offline first website technologies such as service workers, caches and indexedDB, where we can store the website's data and resources locally on the user's device.
- To save our drone from the cyberattacks and decryption of communication channels, we can use secure protocols such as TLS (Transport Layer Security).
- To avoid fail-safes, we can implement redundant communication channels and navigation systems.

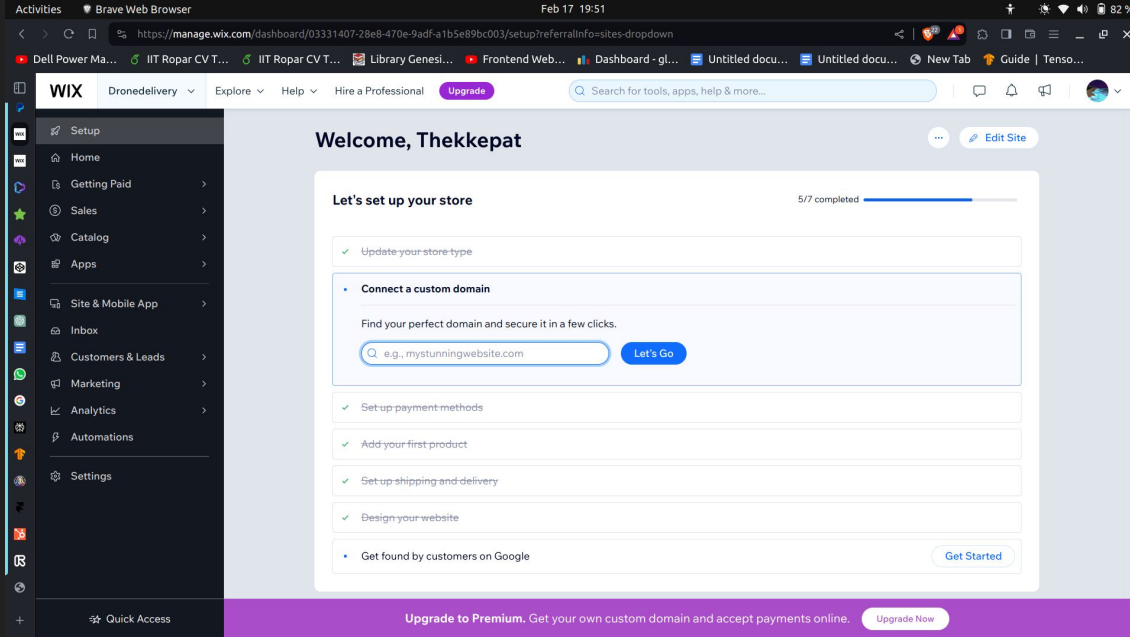
Reaching locations in countries that ban drones or foreign airborne vehicles like Iran or Iraq

- Partnering with local organizations or individuals who are familiar with the regulations and have the necessary permissions can help navigate the restrictions. They can assist in obtaining the required permits and permissions to operate drones or other airborne vehicles in these countries.
- Consulting with legal experts who specialize in aviation law and regulations in the specific country can provide valuable insights and guidance on how to operate within the legal framework.

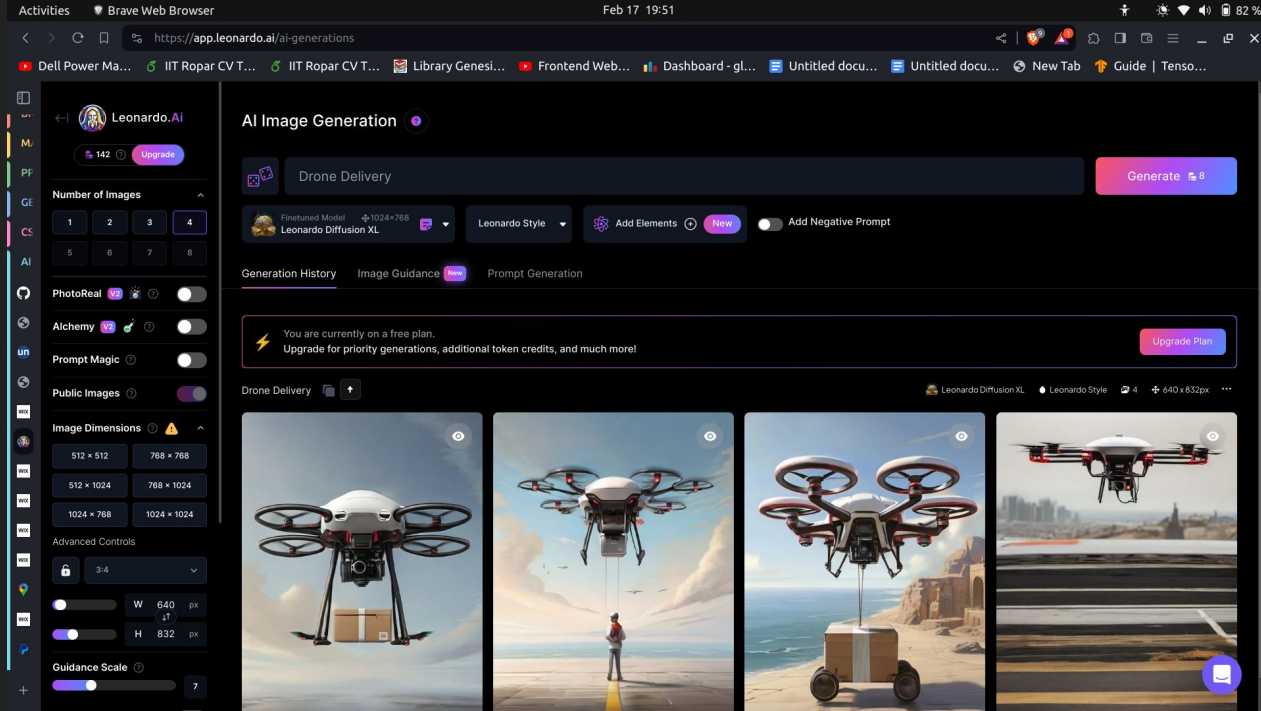
AI Tools used



Perplexity.ai : used for text generation for product descriptions, and also to answer queries that popped up during the hackathon.



Wix.com : To help us in the entire website development process.



Leonardo.ai : To generate background images and product images for the website.