Group 27: H.E.L.P. Project Description Final Summary

By Aqsa Arif, Alberto Ramirez, Lucy Hark

The Heroes' Emergency Life-line Protocol (H.E.L.P) is that A.I. system that uses security cameras, smartphones, mini surveillance drones, facial recognition databases, alongside its adaptive analysis software to analyze these sources. The project is intended to assist first responders to perform their jobs more effectively and improve civilian safety. The goal for civilians is to contribute information from their smartphones and for first responders to use and verify information produced from the H.E.L.P system. With the help of first responders sending their own reports, it will further help the system improve its detection and prediction capabilities.

Parties involved in the product's development, the client would be the The United States Office of Justice. The customer of the product would be heads of first response centers and the hands on users of the product would be the general public and first responders. Engineers working on the physical deployment of the app will work on the design and AI learning. Other teams include: A crisis management team, system designers, and system architects, marketing experts, usability experts, legal experts, app testers, orientation Trainer, security expert, and ethical hackers. Any conflicts between any of the stakeholders will be handled by the HR of the project's team. Software and hardware funding for prototypes will be tested for performance efficiently.

Before H.E.L.P is implemented the equipment for the system, departments of first responders, geographical coverage of drones needs to be pre-planned. Developers will design synchronization between devices and networks for drones, cameras, and phones. Audio transmission needs to be prioritized, then video feed and report generation.

Assumptions being made are users read system alerts and respond accordingly. Basic users will be given a simplified version of the application's data and first responders will have more in depth data due to privacy laws. We assume most of the detection systems will need to be predefined and facial recognition systems will need to be connected to an active database.

The following project report details the product requirements, product use cases, functional/non-functional requirements, performance requirements, precision or accuracy requirements, dependability requirements, robustness or fault-tolerance requirements, maintainability and supportability requirements, cultural and political requirements, operational and environmental requirements, look and feel requirements, usability and humanity requirements, and security requirements.

The functional requirements of the system deals with the individual parts, and how they coordinate with each other. While the non-functional requirements focus on meeting the customer requirements, individual requirements, and running the project through acceptance tests for verification of its test cases. This uses product use cases which details on individual parts of the system and their interrelations with each other and their users. Additionally, use cases identify system boundaries, functional uses of parts, and sequential relationships of different parts of the system. The system's product use cases has individual cases which include: Sound Detection, Mesh Network Detection, Phone Alert, First Responder Alert, Situation Report sent, Operator Analysis, Drone Activation, Drone Surveillance , Drone Live Feed, Post Incident Report, View Reports, Security Camera Analysis, Sound recorded, Video recorded, and Situation Stable Alert. Additional functional requirements include: Sound Analysis, Phone Pinging, Drone Activation, Report Generation, and the Alert System.

The development project report details data requirements, it deals with the geographical aspects ofincident, drone survey activity, drone information capture, and report relevant information like time, location, severity, perpetrator, people injured, first responders status, and situation clearance.

The system's performance requirements focuses on optimizing its chain response in which sound detection is followed by drone activation for surveillance, active analysis and incident level assignment on viable threat, generation of the initial incident report, alert to nearby citizens, alert to first responders, best route calculation, active monitoring of scene, and finally post-incident report generation. Performance criteria include minimal latency and minimal lag.

For the project's accuracy requirements, the system should have high accuracy for its cameras and microphones. The system's language should be clear and illegible. While the capacity requirements of the system should be able to support any magnitude of accident reports, cameras, microphones, data storage, users, and criminal marker information. The system's Dependability Requirements only consists of the information provided by the system being reliable. As for Availability Requirements, drones, reports, and the H.E.L.P. system itself should be maintained and fully functional 24/7.

The H.E.L.P. system's Robustness or Fault-Tolerance Requirements focuses on the H.E.L.P App. The mobile app should be able to provide recent data and information reported through 9-1-1 calls in case drones and H.E.L.P. network is unavailable. Similarly, the Safety-Critical Requirements include Drone (Safety) where the drones need to keep safe distance from civilians.

As for the Maintainability and Supportability Requirements of the system, regular maintenance of the app, cctv cameras, drones, microphone, and servers will be required. The Supportability Requirements falls into basic email support for customers. Additionally, first responders, operators, maintenance teams, and developers would be given an orientation.

The system's Adaptability Requirements mainly fall into the Portability of the system. This is followed by the Scalability or Extensibility Requirements which deals with the size of the project relative to geographical coverage, number of users, and resources management. As for the Longevity Requirements, it is expected that the system will be functional for multiple decades.

The system's Security Requirements mainly deals with aspects of Access Requirements. The system's Integrity Requirements needs to protect Civilian Data, this falls in line with the Privacy Requirements of the system. The Immunity Requirements of the system mostly deals with self-protection from hackers by self-learning after an attack. The Usability and Humanity Requirements deals with Ease of use, Personalize app alert notifications, and basic tutorial. The system's Operational and Environmental Requirements should mainly support large cities, be able to link with external systems like the Criminal Database, have drones installed properly, and have the H.E.L.P. app be accessible easily. The Release requirements of the system should have system updates bi-weekly to monthly with larger updates in a 6 month increments.

Project object design will use singleton design pattern and use programing language java. Package design will include java.util. Problems with the system is getting in the way of first responders. ystem may scare users. system should be able to endure any weather conditions. risks in the system include: privacy laws, false alarms, errors in algorithm. Costs can go upto $1.2 trillion. System has a lot of potential for improvement like infrared or night vision.