Team 40: Call For Code

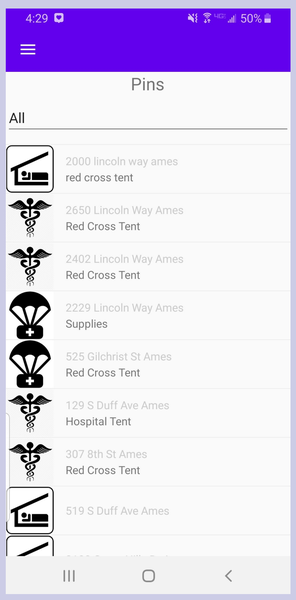
Team Members: Austin Keen, Caleb Nash, David Boschwitz, Justin Kaufer, Logan Fladung, and Robert Schedler

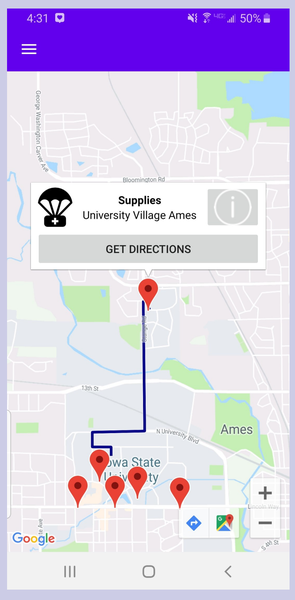
Advisors: Dr. Diane Rover and Dr. Nicholas Fila

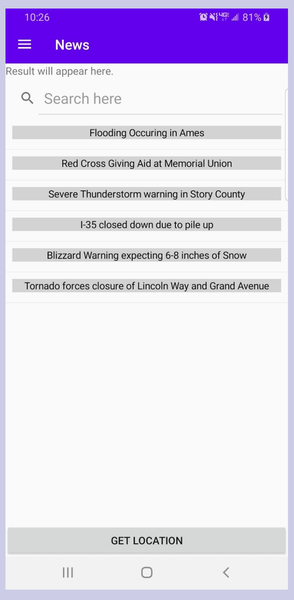
Acknowledgment: American Red Cross

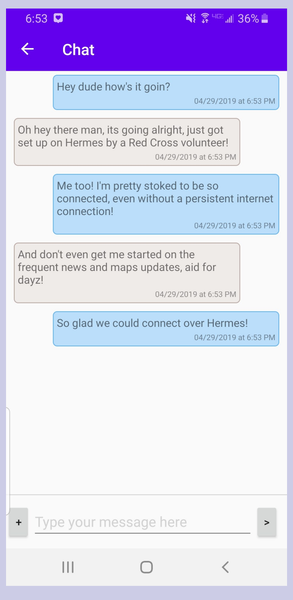
Background & Summary

With natural disasters becoming increasingly more common, ways to provide relief to these victims are becoming more and more necessary. The goal of Call for Code project is to design a tool to improve preparedness for natural disasters and relief when they hit in order to safeguard the health and wellbeing of communities., as well as provide these basic services needed without an internet connection by storing extra data offline and leveraging alternative connectivity methods. This project was inspired by IBM's Call for









Functional Requirements

- Provide users with locations of relief support
- Allow users to communicate with each other via chat messaging within the application
- Function even when internet and cellular connections are unavailable
- Have users status' for differ kinds of users, including relief workers, admin users, and ordinary users
- Allow users to send emergency pings to relief workers
- Provide constant news updates based off location settings

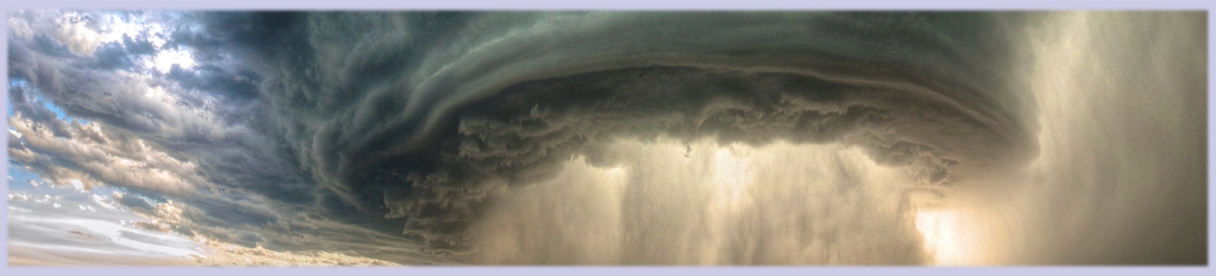
Non-Functional Requirements

Security - Secure sign-in of authenticated users cannot be duped. 100% of messages will be encrypted

Performance - Short response times, within 3 seconds from request. High availability of our entire system with above 99% uptime.

Accessibility - Ease of usability, meaning the interface is easy to learn and navigate. Work with or without network connectivity.

Scalability - Operate from not only concentrated areas but to more distributed regions. Ability to add new features and deploy rapidly.



Applicable Standards & Best Practices

Development approach - The agile approach to aide with future adaptation with regards to user research, prototyping, and testing.

User Focused Design - User research at the core promotes accessibility.

Testing approach - Closely follow the ISO/IEC/IEEE 29119 standard for software testing to stay consistent throughout features.

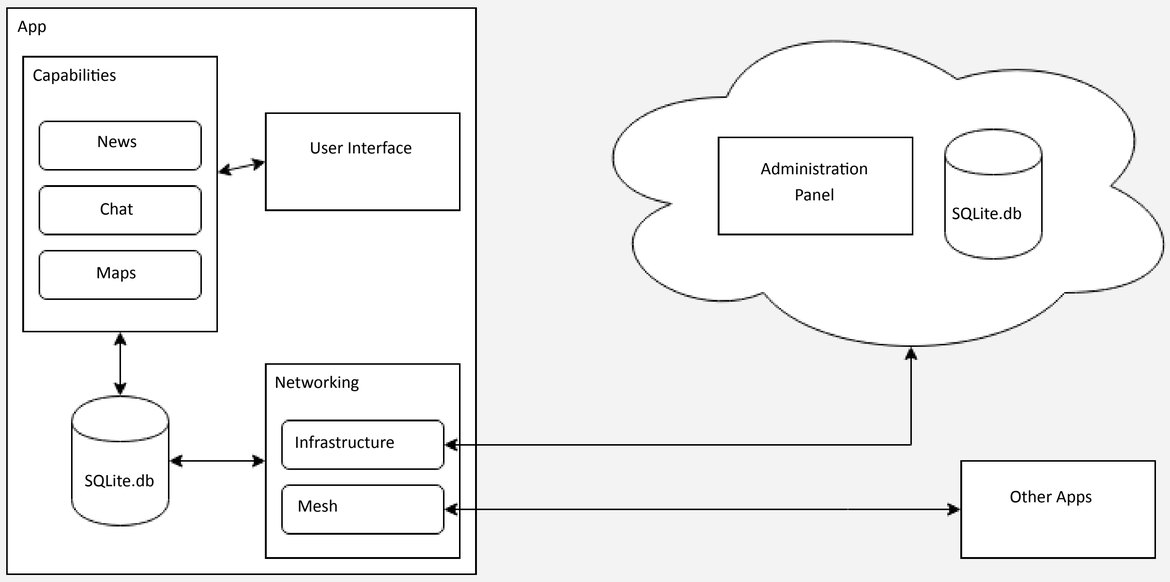
System Architecture & Implementation

Xamarin - A C#/.NET library that allows for cross platform development.

SQLite - A lightweight SQL engine that is commonly used throughout the professional industry.

Google Maps - A web mapping service utilized for maps and routes.

Autofac - Dependency injection container and state machine that asynchronously builds and creates singleton instances



Designing with Empathy

Discovery - Enter the user's world, and absorb what people are going through

Immersion - Experience the user's world, and uncover their specific needs

Connection - Experience the user's perspective on the issue through their eyes

Detachment - Step back into the design mindset, and use information attained

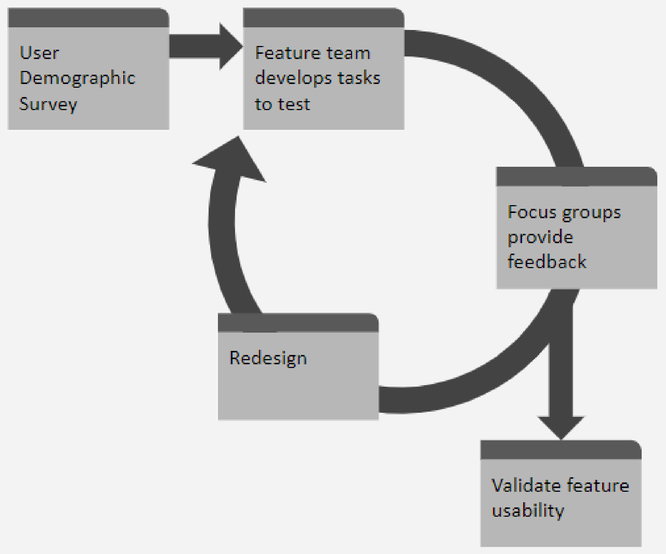
Testing & Evaluation

Unit Testing

Using NUnit we extensively test our code for acceptable code coverage

Integration Testing

The team has done constant testing to ensure integration of components, API's and network are successful.



Conclusion

This application has navigation, communication, and news updates for people that are impacted by natural disasters. Our map shows pins for relief, our messaging platform allows users to message family members and connect with relief workers, and our news updates show relevant articles that relief employees select based on the necessity towards the current natural disaster.

Future Extensions

Mesh Network - allow users access without internet.

Forms - filling out requests to different relief sources

Group Chats - including location and region based chat rooms

Life Alert - emergency SOS beacons for alerting first responders of your location