Development of a Disaster Management App for Flooding

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Citrus College[1], California State University, Fullerton[2]

Background

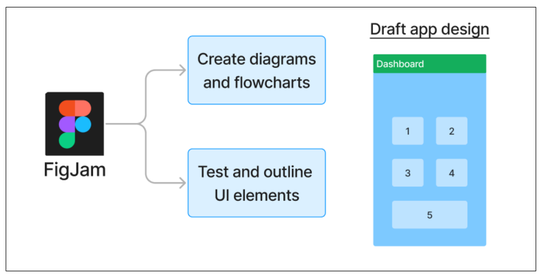
1. During a flood disaster, managing recovery operations and communicating between victims and responders become challenging due to the frantic and chaotic nature of disasters.
2. In these critical moments, having access to accurate information and the ability to use it immediately is crucial for survival.
3. Flood disaster management apps can significantly enhance information flow and decision-making during such crises.
4. Apps enable users to communicate and receive real-time information instantaneously, bypassing the need to navigate through multiple pages of unnecessary data.

Objectives

1. Allow the users of the application to communicate real-time information between themselves and first-aid responders
2. To develop an intuitive and easy-to-use application, with the most important features front-and-center
3. Enhance the response and recovery phases of a disaster
4. Reduce the impact of disasters by keeping users informed and prepared

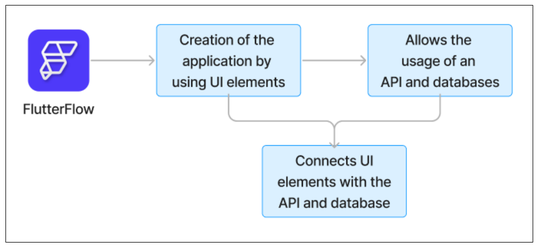
Methods

1. Design and Planning



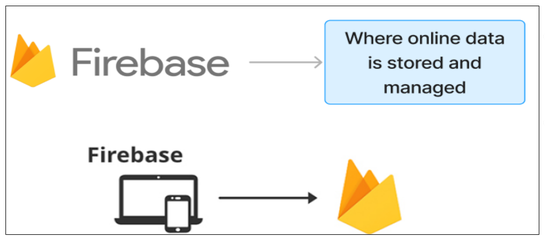
- Focused on creating a user-friendly app
- Used FigJam to test designs
- Provided a basis

2. Interface Development



- Application builder called FlutterFlow
- Used to build pages and components
- Used diagrams in FigJam to create app

3. Data Management



- Google Firebase for database management
- Stores data locally in FlutterFlow, then online in Firebase

Results

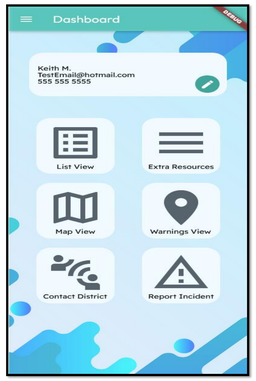


Fig 1.1 – Launch Screen

Fig 1.2 - "Hospital View List" Page

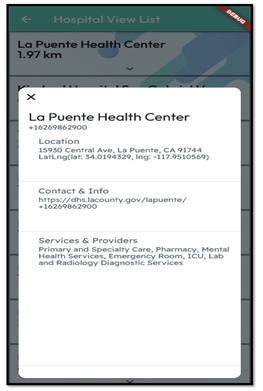


Fig 1.3 - Displaying Hospital Information

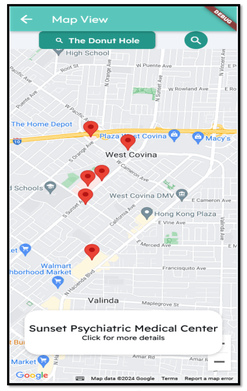


Fig 1.4 – Google Maps Widget "Map View"

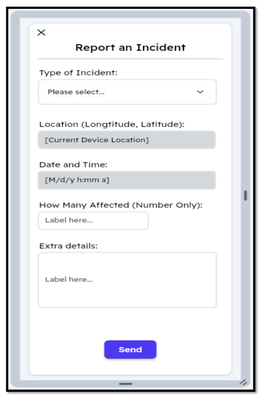


Fig 1.5 – "Report an Incident" Form

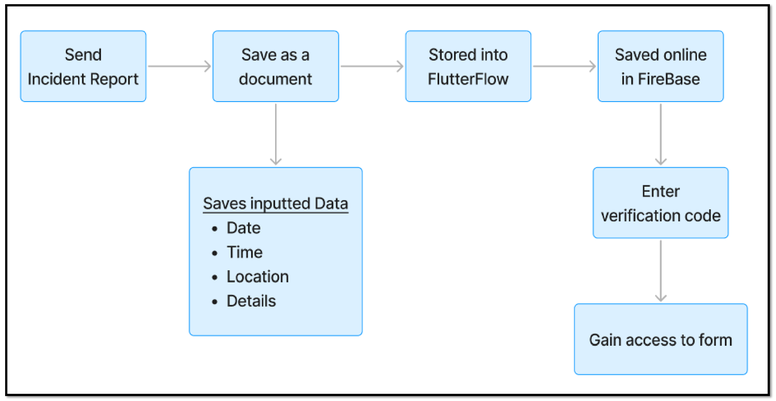


Fig 1.6 – "Incident Report" Document Journey

Discussion

Fig. 1.1 – Launch screen of the application, with the core features of the app front-and-center.
Fig 1.2 – When clicking "List View", it will open a generated list of nearby hospitals depending on your location showing the name and distance in km.
Fig 1.3 – Clicking any of the hospital names will open a component that displays extra information of the hospital, like location, number, and website.
Fig 1.4 – When clicking "Map View", it will open a Google Maps widget that displays pinpoints of nearby hospitals near you.
Fig 1.5 – When clicking "Report Incident", it will open a component where it will automatically input the date and location of the user and allows the user to input extra details of what type of disaster they're experiencing.
Fig 1.6 – How "Report Incident" form functions. The user would hit the "Send" button, which will save the data through the form of a document, which is stored locally within the app.

Future Work

1. Incorporate more disaster management features, such as emergency response logistics
2. Improve on the Geographical Information System (GIS) component of the app
3. Introduce machine learning modules for predicting possible disaster events, using early warning signs

References

1. Fajardo, J. T. & Oppus, C. (2010). A Mobile Disaster Management System Using the Android Technology. *WSEAS TRANSACTIONS on COMMUNICATIONS*, *9*, 343-353. https://dl.acm.org/doi/10.5555/1852365.1852366

1. Sharma, S. K., Misra, S. K., & Singh, J. B. (2020). The role of GIS-enabled mobile applications in disaster management: A case analysis of cyclone Gaja in India. *International Journal of Information Management*, *51*, 102030. https://doi.org/10.1016/j.ijinfomgt.2019.10.015

Acknowledgements

1. Project supported by Project RAISER, U.S. Department of Education HSI-STEM award P031C210118.
2. Computational Epidemiology, Data and Disaster Intelligence (CEDDI) Lab, California State University, Fullerton.

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