Mobile Application Project—— Emergency Calls

Client: Brian McKeown

Team: Kaili Lin, Peirong Zhao, Jie Song, Yuhao Shi, Majed Alharbi

Mentor: Sarita Pais
Moderator: Jairo Gutierrez

Background

The main purpose of the project is to enable emergency calls through a mobile phone app and sensor device for users with epilepsy. The goal of this project was to design and develop an app on Android studio, and users can call for help through an external device (SOS button). When the user presses a button on the SOS button, the phone can call emergency contacts saved in the system. If no responses are acknowledged by the caregivers, then ambulance is called.The app can locate the user's geographical location and issue a warning sound for help when the user presses the button.

Rationale

Our project was aimed at patients suffering from epilepsy. Our client had found that if epilepsy patients are alone, they cannot contact in time if they have a seizure. In order to ensure that patients with epilepsy can contact caregivers/family members as soon as possible to ensure the fastest rescue, we have designed a mobile app to be carried around. When patient with epilepsy is sick, they can quickly click the button, and the trigger of the button will dial the patient's pre-stored phone number through the mobile phone application bundled with the button. When making a call, the edited help message will be sent to the designated phone user. When the button is triggered, the current location will also be sent through the mobile phone, so that the exact position of the patient can be obtained in time for rescue.

Objectives

This project aims to develop a mobile application and help patients with epilepsy:

1. For registration and information details: the patient needs to enter his basic information and the phone number of the emergency contact(s).
2. When using the SOS button, it is necessary to connect the mobile phone application software with the button to ensure that there will be no connectivity issues . The simple operation of the button during the patient's emergency situation shortens the time for the patient to get help in the fastest possible way.
3. To address the client's need for a mobile application for patients and elderly that can connect with their family members/caregiver or ambulance by pushing a physical button.
4. To create an interface that can display GPS via Google map and show patient's geographical location.
5. To make the interface user-friendly as to benefit family member/caregiver can easily see patient's location on Google map through GPS.

Project Goals

One more advanced feature we are going to add here is that if the button is pressed it not only make the call but also it will show the Google map location of the person who pressed the button. In the case of domestic violence, the person can press the button without the knowledge of the abuser.

Management Methodology

The Program Management Methodology (PMM) was successfully realized through multiple strategic benefits related to the entire organization. A set of components composed of plans and projects of various sizes, and by making the program advance through the entire program management life cycle was planned. The plan ensured collaboration between the constituent teams to maximize the benefits of the plan. The following are the key parts required in the methodology:

- Project charter
- WSB
- Project Schedule
- Risk Register
- Quality Assurance Plan
- Issue Logs
- Scoop statement
- Milestone Report

The project management method used by the team to manage the project advances the project to the following four life cycle stages:

Initiation: Define project goals, scope, roles and responsibilities, and get authorization to start

Planning: Determine the breakdown of work, how it will be achieved, when and by whom.

Execution: Manage time, scope, procurement, risk, communication, resources, cost/budget, change and quality. Track and report on project status.

Closure: finalize all activities, complete deliverables, measure success and officially end the project.

The team used the Scrum to cycle through between different phases - Requirements Analysis, Design & Development, Testing to ensure the successful delivery of the product.

Application Development Processes

Development is driven by the scrum method. First, product requirements are divided into multiple iterations or increments, and iterative delivery is completed through a sprint in 4 weeks. After each sprint is completed, a sprint retrospective meeting was held, in which all team members reflected on this sprint, as to improve the next sprint. Scrum development consists of the following elements:

- Product Backlog, which lists the requirements that this project should achieve, and the requirements are described in the form of user stories. The project owner selects high-priority requirements from the Product Backlog for development. The selected requirements are discussed, analyzed, and estimated at the Sprint planning meeting to obtain a corresponding task list, which is called the Sprint backlog.
- Sprint backlog is a specific task that the team needs to complete in an iteration, and it is also the most used Backlog in the development process, which is very detailed. When the team completes all tasks in the Sprint backlog list, this Sprint ends and enters the next Sprint iteration cycle.
- Sprint retrospective meeting, mainly summarizes the experience and lessons of this Sprint implementation, and how to make improvements in the next Sprint.

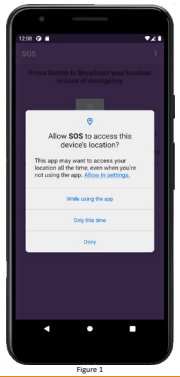

Figure 1

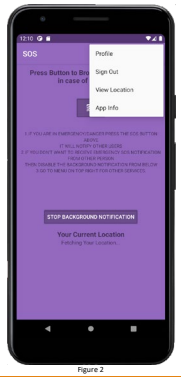

Figure 2

Figure 3

Figure1. The app ask for access to upload/download map and location information through Google Map GPS service.

Figure2. Main theme, menu bar, main interface.

Figure3. User Signup function, signup through email and phone number. Data connect to database in backstage.

Quality assurance

We used Quality Assurance templates that enabled us to do the following:

1.Quality assurance plan [version control, main user requirements functions deliverables]
2.Quality control checklist [user story management, product backlog]
3.Prototype [UI design, feedback from Client and Mentor]
4.Testing [unit, integration, acceptance]
5.Sprint Implementation [Trello board, sprint retrospective meeting]
6.Project management [risk register, issue register, issue log, milestone report, project schedule]

Challenges

Technical

- Developing feature for button function. It was difficult to send message when the user use button to call the emergency center.
- In the early development process of button function, we could not open the tested application on the mobile phone.

Non-Technical

- One of team member was not in New-Zealand and had communication difficulties with difference in time zones.
- Unable to find the appropriate SOS button which could communicate with mobile app.
- Difficulties meeting face-to-face as per planned timetable with Lockdown.
- No prior experience using Android application.

Lessons Learned

- The importance of communication between the group members. Meting minutes and sprint timetable are necessary for project to be completed on time.
- The importance of expanding the knowledge about Android phone program development.
- We've learned how to work together more efficiently as a team in this project.
- Learned how to use Flutter to develop Android application.

Recommendations

1. Improve button performance and shorten the response time of connecting with the mobile phone after the button is triggered.
2. The security of mobile apps.
3. The security of the customer information database.
4. Improve the UI and customer experience of mobile phone applications.
5.Expand the scope of application.
6.The mobile phone application supports other mobile phone systems.