

BI-WEEKLY REPORT I

Project: Well-Being Data Anonymisation with IOS

Client: GOSH

Team 33

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Project stage: Kick off

Project description:

Develop a mobile phone app and a way of representing data arising from app usage.

Enable:

- A method for representing sensor data arising on a phone in an app.
- The app to visualise the data on phone and via exports to a Linode based database.
- The resulting database to be augmented with web-based form data,
- Data to be used to inform a mathematical model to predict circumstances and trends using Python and Java scripts.
- A model to be persisted and updated by the mobile phone user.
- An environment whereby the resulting app can be deployed
- App users to share anonymised data.
- The persistence of anonymised app data (coded to FIHR and SNOMED) on a Linode server representing data in an outbound postcode map.
- Postcode maps of anonymised data to be understood by the general public.

Overview

We received a set of requirements to tell us what the project is about, which has been placed in the project description above. Shortly after receiving our requirements we met up with our client and discussed what was required to come out from the project so that we could successfully complete the project. During this meeting we discussed what the future of the project would be, examples of use cases, and exactly what the app would do. Through this meeting, any misunderstandings were cleared and questions that our team had about the project was answered.

During this meeting we also discussed the way the project would be handled:

- A WhatsApp group with the client was set-up to ensure that any blockers (any problems) would be dealt with
- A Trello board was set up so that we could post the research that we did, and where the legacy code was also posted
- Weekly Zoom meetings on Mondays at 10:45 where we would do stand-ups: where each member of the team would tell everyone else what they had done over the last week and what would be done over the course of the next week

Following on from the initial client meeting, we then did some research to understand what we were going to be making for this project, so that we could understand the difficulties that we may face, so that our team will be prepared in coming up with possible solutions in how to overcome this. Our main research was to find out about what sensor data can be collected from the IOS, and from the usage of the Apple HealthKit, from this we found out that we could easily access pedometer, distance moved, sleep time. However, we also found out that getting background information off an IOS device about the users' usage of a phone (i.e. how long they spent on a certain app, the amount of time they spent on a call) would be difficult due to the ways in which IOS apps are protected. One way in which we could overcome this would be to use MDM which would allow the app to be able to get information to the data that would currently not be possible. How MDM would be used and what MDM could access were reported back to our clients during our weekly client meetings.

A new article was released about the new methods in which Apple are tackling the creation of fake accounts. They will use machine learning technology to decide whether the user is performing "ordinary, everyday behaviour such as moving from place to place, sending messages, receiving emails, or taking photos," Apple said.

(https://mobile.reuters.com/article/amp/idUSKBN1XG21J?_twitter_impression=true) This is a possible solution to the way in which we can then access how the user is using their phones. If we could use the same code that Apple were using to achieve their end-goal, we would also be able to successfully complete our project with no barriers. We were lucky enough to have some Apple developers come into to the university. This meant that we talked to them about our projects, while our client was present as well. Our client had met up with the Apple team and had notified us that we would get a chance to be trained to use the libraries that will allow what was mentioned in the article to be executed.

During our second meeting with the client, we were notified of new important information. Our client informed us of how the day before he had visited potential users of our system, i.e. the carers responsible for a group of people and the people being cared for to figure out what they wanted from the system. Talking to potential users told us that what they wanted from the system. From the point of view of the user who is being cared for, what they wanted was a way to notify the people who are taking care of them if they aren't well. From the point of view of the carers, they wanted to know the different people who weren't well, as they took care of large amounts of people. One way to be able to implement this would be to analyse the amount someone walks on average and then alert the carer, through a text message, if they had worked less than the average amount.

To be able to understand the sub-app that we will be creating we have conducted Market research to find out whether there exists an app which already perform a similar functionality to the idea which we have. Through this we found out that there are certain apps like FamilyRollCall, SenseQ Care and buddi. We conducted this research to see how we can make our app unique and to see whether solutions to this problem exists.

Another one of the key processes that has been taking place since the project has started is that our team is now learning a new language to be able to do this project. We are learning Swift, a language that enables us to do IOS development which is the platform in which we will be releasing our app, as we are targeting users of the iPhone in particular.

Completed tasks

- Research into what the project requires from us
 - Understood what data IOS devices can read in while running in the background
- Made progress in learning swift
 - We are now quite familiar with the syntax of the language
- Conducted Market Research

Problems encountered

Some of the problems that we have run into so far since the beginning of the project would be the fact that some of the members of the team do not have access to a Mac laptop. This means that being able to code would have been a problem, as X-Code is only available on Mac. However, as a solution, the university has loaned as Mac Minis which has meant that we can now proceed as normal.

Another issue that we have looked into is the way in which the IOS device will read in background data. The solution for how this will be resolved has been mentioned in the overview section of the document (MDM or through training from Apple).

Reviewing rate of progress

Our Trello page that is shared by all the members and the client has a project sprint. This is an outline of what we should be doing currently and what we will be doing. We have successfully completed the first sprint which is the Research part of the project.

We are now well into the middle of the next sprint which is the Coding part, as we are now focusing on learning and refining our Swift skills.

Identifying problems to be resolved

The next problem that we have to solve would be working out the scope of the training with the Apple team, i.e. figuring out exactly what we will need to know in order to be able to complete the information. As well as this, we then have to figure out a date for this training to take place.

Next steps (next 2 weeks)

The next steps that we will be taking care of will be ensuring that we are familiar with the key Swift libraries that are required to be able to complete the project. We will need to get familiar with the functions that are available to us in the language and to figure out how these functions will be used, i.e. the parameters and the return type ...etc. One way our team will go about this, is that, since we have to make amendments and improvements to the legacy code, we can rebuild the app from scratch while taking key functionalities from legacy code that has been handed to us.

Another one of our key next steps is to start building the sub-app and look into how exactly we will be sending text notifications from the app to another carer's phone. We have found out the IOS does not allow the automation of text message sending, there must be user interaction, which is something that is not what the purpose of the app requires. We have found out that a server must be set up so that the server can then send across text messages.

We will also be looking into how to visualise the wellness scores and place them on an outbound postcode map. To do this we will be needing JavaScript and we will need to understand how the phone will be sending across the data anonymously to a server which will then place this data on the map. We will need to look into how the data in the server will be placed onto the map.