

Computer Games Development CW208

SRS and Project Report

Year IV

Oisín Wilson

C00213826

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Faculty of \_\_\_\_IT CARLOW\_\_\_\_\_

Open-Book and Remote Assessment Cover Page

Student Name: Oisín Wilson

Student Number: C00213826

Lecturer Name: Oisín Cawley

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Contents

[Acknowledgements](#_gjdgxs) **3**

[**Project Abstract**](#_sh00pr9nz48e) **4**

[**Project Introduction**](#_6b5hb71tx9uh) **4**

[**Background**](#_uzzqntvmbfpp) **4**

[**Project Description**](#_h752blffqdmz) **5**

[Define the Application](#_3dy6vkm) **6**

[**What is the application supposed to do**](#_z1ukdq1b8lwo) **6**

[**Who is going to be using this application**](#_kxjcbpmby88z) **6**

[**Use Cases**](#_bdfp5t96dsjz) **7**

[**Metrics**](#_wwychk3rpfpm) **9**

[**Is there a precedent for this application?:**](#_d9sb8v5agufz) **9**

[**Design Manual**](#_cnt8boup85p9) **9**

[**Project Milestones**](#_d68p5vkdqs8e) **11**

[**Project Review and Conclusions**](#_rh9lvqlg4dmm) **11**

[**References**](#_5wr0343spsrc) **12**

# **Acknowledgements**

I would like to thank all of the current and prior participants of the DESQOL Erasmus+ project for laying the groundwork and gathering a large body of information on coeliacs.

# **Project Abstract**

This project will be a study in colour psychology with technology and how it can influence the perceptions and enhance the effectiveness of applications within the context of behavior change.

# **Project Introduction**

This project is one of three projects that all individually aim to create features for one collective mobile application, that aims to assist people who are suffering from celiacs disease. The overarching celiac app project was started last year by Dr Alfonso Rodriguez-Herrera and the IT-Carlow Erasmus+ team. Within this, the different parts of functionality for the app were split up and tasked amongst last year's members. This year we are building upon the work done from those past members by splitting up rolls just as they did. The segment I have been tasked with is the symptom tracker and information display, while my other co-students are working on A Quiz and A GIP Stick scanner.

I chose to undertake this project as I saw it as an exciting opportunity to partake in a multi country collaboration while simultaneously completing the requirements of my final year in Games Development. This project is to provide an application that persuades Celiac patients to perform a particular action, that being journaling their dietary habits and their symptoms. This is being done with the end goal of making the process of documenting a celiac’s symptoms and dietary intake more meaningful, habitual and enjoyable.

# **Background**

This Project was started by Dr Alfonso Rodriguez-Herrera from St Luke's Hospital in Kilkenny and is going under the name of DESQOL. Which is a pseudo acronym for “Teaching Interdisciplinary Human Centered Design to Improve Patient Quality of Life”. With the assistance of IT Carlow and the Erasmus+ program, the project has grown and is currently being participated by people from:

* IT Carlow.
* St. Luke's Hospital Kilkenny, HSE.
* FHV, Vorarlberg University of Applied Sciences.
* HVA, Amsterdam.
* Grupo IHP, Andalucia, Spain.

Last year’s students laid down the groundwork in creating react web apps that fulfill their allocated fields respectively. This year we have been tasked with porting their work into mobile applications while improving upon their designs and functionality.

I have a small bit of experience working with Java, Javascript and SQL as they were languages touched upon within the Web Development & Databases module of last year. However I have no experience using React or React Native, which marks a significant learning in this project. I’ve also begun researching methods of displaying the information gathered by the app so that the user can easily see their health progress over time. I feel that giving the user an option to change the graph types from a line chart to a pie chart or even a spider chart as this will appeal to a wider audience.

# **Project Description**

The goal for my finished product is to have a collection of components that can be put into applications with the intent of positive behavior change. My intended components are:

* Switchable Data Display component.
* Calendar component.
* Input component.
* Barcode scanner component.

I will be adding my created display type called Circle View to the main application. This display type mashes two properties together in a unique way. Those properties being a progress bar and a calendar. This view Utilizes a circular progress bar that will be representative of the monthly progress. Within this bar there will be small circles that represent each day that has passed in the month. Those circles will be the appropriate colour to what kind of inputs were done on that day. This display type will be tested in the first 21 Day challenge and all going well,this will be used in the colour palette test in the second 21 Day challenge.

To obtain data from the user I will be incorporating an input screen, where the user will have a selection of input types to expand the level of data that can be recorded. The selection will include :

* Mood
  + Terrible
  + Poor
  + Just ok
  + Good
  + Great
* Gluten
  + yes
  + no
* Meal
  + Breakfast
  + Snack
  + Lunch
  + Tea
  + Dinner
* Symptoms
  + Diarrhea
  + Stomachache
  + Headache
  + Fatigue
  + Irritability
  + Vomiting
  + Rash
  + Weight loss

The symptom selection will be a multiple selection and the rest will be a singular selection. All of the inputs selected from this screen will be stored within a locally created SQL database on their mobile device.

For comparative purposes, I will incorporate a standard calendar into the app that will be used to bluntly display the data as a list to the user, thus giving them more options of reading their inputed data.

To make the data input more convenient the user should have the option to scan the barcodes of food to save them the time of typing out a lengthy product name.

# 

# **Define the Application**

This application is to be a means of helping celiacs that either just found out that they have this disease or celiacs that are struggling with keeping a consistent diet, through the process of tracking and displaying their diet and their symptoms.

# **What is the application supposed to do**

This application has the function of inputting diet and symptoms to a local database on the mobile and then displaying the inputted data in a creative way that creates positive associations and a knock on effect to dietary behaviour change.

# **Who is going to be using this application**

The target users are to be teenage-adult celiacs.

# **Use Cases**

Use Case 1 : Input into the app

Actor: Celiac Patient

Basic Flow:

The celiac patient opens the app and is greeted to a circular display with a slider and a set of buttons below it.

They look at the set of buttons and press the input button.

The Celiac then sees a set of input types labeled Mood, Gluten, Meal and symptoms.

The Celiac Clicks Mood and sees a drop down list saying “Terrible” , “Poor”, “Just ok”, “Good”, “Great”.

The Celiac presses “Good”.

The Celiac Clicks Gluten and sees a drop down list saying “Yes” , “No”.

The Celiac presses “Yes”.

The Celiac taps Meal bringing up a list of meal types: “Breakfast”, “Snack”, “Lunch”, “Tea”, “Dinner”

The Celiac taps “Breakfast”

On screen a Text box appears with a barcode button beside it.

The celiac taps the text box bringing up the mobiles keyboard and writes “Eggs”

The Celiac lowers the keyboard and scrolls down to see a list of checkboxes under the input type Symptoms, those being “Diarrhea”, “Stomachache”, “Headache”, “Fatigue”, “Irritability”, “Vomiting”, “Rash” and “Weight loss”.

The Celiac tapps HeadAche highlighting it.

The celiac patient then scrolls down and clicks submit.

Use case 2 : Check Full Input List

Actor: Celiac Patient

Basic Flow:

The celiac patient opens the app and is greeted to a circular display with a slider and a set of buttons below it.

They look at the set of buttons and press the calendar button.

The Celiac sees a calendar on screen with a blank space underneath it.

The celiac then presses the current date with their finger showing a list of their pripor inputs in the blank space.

Use Case 3: Change the display type

Actor: Celiac Patient

Basic Flow:

The celiac patient opens the app and is greeted to a circular display with a slider and a set of buttons below it.

The Patient then drags their finger along the slider changing the circular display to a pie chart display.

Use Case 4: Input scanned product

Actor: Celiac Patient

Basic Flow:

The celiac patient opens the app and is greeted to a circular display with a slider and a set of buttons below it.

They look at the set of buttons and press the input button.

The Celiac then sees a set of input types labeled Mood, Gluten, Meal and symptoms.

The Celiac then scrolls down and taps Meal, bringing up a list of meal types: “Breakfast”, “Snack”, “Lunch”, “Tea”, “Dinner”

The Celiac taps “Snack”

On screen a Text box appears with a barcode button beside it.

The Celiac tapps the barcode button, turning on their phone camera.

The Celiac brings the barcode on their packet of crisps to the camera.

Two buttons appear, One saying “Retake” the other saying “Confirm”.

The Celiac clicks “Confirm” and is brought back to the input screen but in the text box the name of the crisps is written there.

The Celiac then scrolls down and clicks “Submit”

# **Metrics**

This app will be subjected to two 21 day challenges from celiac patents. Success will be measured by comparing if the celiacs inputs on to the database had a positive or negative correlation to the colour palettes utilised in the data displaying.

# **Is there a precedent for this application?:**

This app will be a continuation of the symptom tracker project from the year prior to mine. They made a web app that functioned as a basic means of inputting to a database. Though this project takes heavy influence from that project this will differ in the sense that I’m making it a mobile application instead of a web app. My project will also place great importance on displaying the data that has been gathered on the user.

# **Design Manual**

Every screen will incorporate the bottom navigation bar. This will be split up into three main segments, the Home screen, Calendar screen and Input screen. At the beginning the Home screen will be highlighted, indicating that that is the current screen. If you tap either of the non highlighted icons on the bottom bar it will bring you to the associated screen and change the highlight to the tapped icon.

The Home Screen consists of a center display with a legend under it and a slider underneath that. The beginning display is the Circle View, this should look like a circular progress bar that has little circles within it. Under the main progress bar there is a legend explaining the what colours mean what. If interacted with the slider can slide to change the center display from the Circle View to the Pi View. The Pi View will be a pi chart but as the segments get larger their radius will also get larger.

The calendar screen consists of a calendar with a piece of empty space below it, the current day should be highlighted. When the user clicks on a date on the calendar the empty space gets filled with the days data from the database and the time it was inputted.

The Input screen will consist of four boxes, symptom will have multi selectable checkboxes under it, whereas the rest will have drop down menus. After selecting the meal time the user will see a text box and a scanner button. Clicking the scanner button navigates them to the scanScreen and the text box can be clicked and whatever they ate can be inputted.

* Mood
  + Terrible
  + Poor
  + Just ok
  + Good
  + Great
* Gluten
  + yes
  + no
* Meal
  + Breakfast
  + Snack
  + Lunch
  + Tea
  + Dinner
* Symptoms
  + Diarrhea
  + Stomachache
  + Headache
  + Fatigue
  + Irritability
  + Vomiting
  + Rash
  + Weight loss

After interacting with any of the options above a submit button will appear at the bottom of the screen, clicking this will input there selected choices into the database.

The scan screen wont have the bottom navigation bar and will be taken up by what the rear camera on the phone sees. Once the camera is brought within range of a barcode a green button will pop up on screen saying “confirm” and a black button will pop up saying “retake”. Clicking the retake button keeps the user on the screen and removes the buttons, allowing them to scan something else. Clicking the confirm button will store the name of the product in the meal description text box.

# **Project Milestones**

7th Oct: Project approval

14th Oct: Begin sprint 1

11th Nov: Submit Research Document

18th Nov: Begin Sprint 2

9th Dec: Submit SRS and TDD along side a Code Demo

6th Jan: Begin sprint 3

9th Mar: Begin sprint 4

30th Apr: Present Project

# **Project Review and Conclusions**

Coming from a C++ background, I found that React Native had a steep learning curve throughout the entirety of the project. I found using the framework to be very productive but when there were issues, it was very hard to debug due to being quite abstracted from the underlying code.

This can be a common problem with using frameworks.

Although from a functionality standpoint React Native was an excellent choice, as its ability to produce apps and components that can function on both IOS and Android speed up the development as a whole.

I am very happy with how my custom made display type (The Circle View) turned out in the end as it manages to fulfill the role of a mini calendar, while showing the user a brief history of what they have entered.

I believe the use of Expo during this project drastically helped development, as it has premade permission libraries that assists with accessing aspects of the phone. Especially the camera and without it I would not have been able to get a working barcode scanner in the project.

The most complex aspect for me during this project was creating a REST API. It serves as an Out-of-App notification manager that can send messages to a user’s phone, even if the main app is closed. I haven't created a REST API before and it was a foreign concept for me to wrap my head around. The networking aspect of it was especially challenging.

A primary issue I had over the duration of the project was sending push notifications to Android as it was more problematic than its IOS counterpart. Ultimately it had to be dropped from the Android App due to time restraints. I also would’ve liked to have created more display types to be tested in the second 21 day challenge but that never came to fruition.

Unfortunately the covid-19 outbreak reduced the amount of testing that could be done, as the 21 day challenge was being arranged by St. Luke’s hospital. They redirected all of their resources to deal with the pandemic.

If I were to do this project again, I would try to incorporate gamification into the data input and display, as I feel that it would elevate the overall engagement and increase the chances of reinforcing dietary awareness.

# **References**