



Waterford Institute *of* Technology

INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

**PROJECT**

**HIGHER DIPLOMA IN SCIENCE**

**IN COMPUTER SCIENCE (NFQ - LEVEL 8)**

**2019-2021**

**FINAL REPORT**

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## Abstract

# iSurvey – Survey Management System



Kerry County Council as a government body has always relied heavily on public feedback and consultation and that is true now more than ever with Community projects, and Part VIII consultations more prominent than ever in the county with public feedback a pivotal point in this process. Bearing in mind that online consultations have been ever popular during Covid-19 and the lack of an in-house designed and developed mobile application within the organization, I chose to design, develop and produce a survey management system designed to give greater control of the data to the organization in a much more dynamic fashion rather than relying on external applications. Using the technologies and software I have learned in the HDip in Computer Science in WIT over the last two and half years, I have developed a back office/mobile application designed to aid survey takers throughout the streets of Kerry to gauge public opinion on the latest and most important issues within the county. These opinions are then fed back to the organization and become part of the consultation process within Kerry County Council.

This system involves:

- A back end node application where surveys, questions and users can be added, edited or deleted.
- Questions can then be assigned to a survey and surveys assigned to a user.
- Each user is given an id and passcode which they can use on a mobile application known as Survey Taker to access the surveys that have been assigned to them.
- This user then accesses the necessary surveys on the Survey Taker mobile application, gathers data from the general public and
- Uploads the completed surveys to the back end application which produces reports on the data given.

As a prototype this application ticks all the necessary boxes and the flow is slick and easy to use. However, there are a number of requirements necessary to move this product from prototype to production.

- Hosting this application would be the obvious next step as this project is configured to work in the development environment.
- Enhancing security would be another important change that would need to be applied to the application.
- The design would have benefitted from extra time to perhaps add a splash screen, login screen and make the application more aesthetically pleasing as most of the time spent on this project concerned with its functionality.

Overall, it was a very rewarding project to complete as not only will it be of use within my working environment but it also demonstrated how my technical knowledge and competencies within the IT sector have been developed since the HDip in Computer Science began.

## Keywords:

Survey, Node.js, Android, Survey Taker, Application, Kerry County Council, Back Office, Front End, Public Consultation, Mobile

**Declaration of authenticity**

I declare that the work that follows is my own, and that any quotations from any sources (e.g. books, journals, the internet) are clearly identified as such by the use of 'single quotation marks', for shorter excerpt and identified italics for longer quotations. All quotations and paraphrases are accompanied by (date, author) in the text and a fuller citation is the bibliography. I have not submitted the work represented in this report in any other course of study leading to an academic award.

Signed: **John McCann**

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## 1.1 BACKGROUND

iSurvey is a backoffice to mobile application project designed to aid Kerry County Council with public consultations that arise and enable staff to get public opinion by surveying the public with the aid of this mobile app. Using technologies and knowledge developed throughout this course and in a time where the county of Kerry is experiencing dramatic changes, the public's feedback is important now more than ever and this app enables Kerry County Council staff to gain easy, dynamic and important public feedback with relative ease to the end user. Historically within the organisation, previous applications were third party systems that didn't give Kerry County Council the flexibility and control that iSurvey will.

## 1.2 PROJECT AIMS

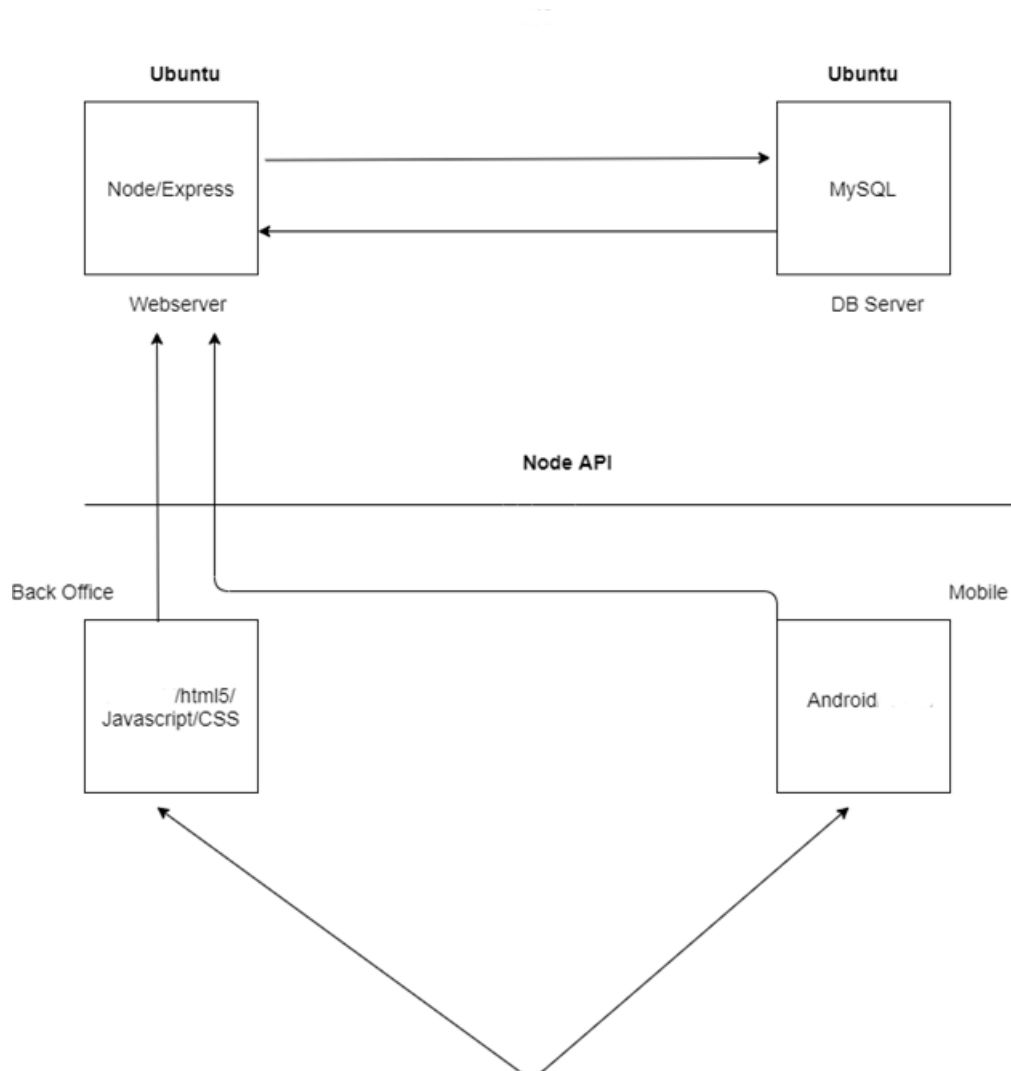


Figure 1 - Project Aims Diagram

This project will give control, flexibility and ownership of all surveys created within the application to Kerry County Council to operate public feedback in a more specialised and effective manner. Firstly, a survey is created in the back office and saved in a database. Staff then connect via a mobile app to the database to download the survey. They then run the survey on the application, save and upload answers when completed.

The Back Office has the following functionality:

- Create Survey
- Create Questions
- Assign Questions to Survey
- Assign Survey to User
- Process Survey Answers

On the mobile side the functionality includes:

- Download Surveys
- List Surveys
- Gather Answers
- Upload Completed Survey
- Settings

## 2 TECHNOLOGIES

### 2.1 Hardware – Laptop, Mobile Phone

### 2.2 Development Tools - VSCode and Android Studio

**2.2.1 VSCode:** As a development tool used in ICT Skills 2 Module of the course, familiarity and previous knowledge of this tool was a strong factor in choosing it for this project. VS Code is built with web development in mind with enriched built-in support for Node.js development and also includes great tooling for web technologies such as JSX, HTML, CSS, and JSON, all of which are evident within the project.

**2.2.2 Android Studio:** Familiarity with Android Studio as a result of the Mobile Development Module and the incorporation of a mobile application into this project was the chief driving force behind choosing Android Studio. It's easy to use interface, integration with firebase and cloud integration along with its highly efficient testing tools makes Android Studio the perfect development tool for this project.

### 2.3 Frameworks/libraries – Node/Express

**2.3.1 Node:** As a framework that I've been using since the Enterprise Web Development Module, comfortability and familiarity of using node.js along with scalability, ease of use and reputation as a mature



and well tested tool that ensured that the node.js framework would be included in the development of this project.

**2.3.2 Express:** As Express.js is the web application framework for Node.js. and provides features that make web application development fast and easy which would otherwise take more time using only Node.js is a natural fit for this project. It's also easy to configure and customize, allows you to create REST API server and is easy to connect with databases such as MongoDB and MySQL making it a perfect fit for this project.

## **2.4 Languages** – Javascript

**2.4.1 Javascript:** With javascript being an integral part of the HDip since the ICT Skills 1 module my knowledge and skills using this language have largely improved and it is the language most comfortable and suited to this particular project for me. It's dynamic nature, versatility and speed make it the ideal language for this project.

**2.4.2 Java:** Having become familiar with Java throughout the course, the language's ease of use and my previous experience in it makes it ideal for this project. My preference for it over Kotlin for the mobile development was largely due to familiarity that I had acquired over the modules taken with the proviso that perhaps with extra time at a later date that the code could always be converted to Kotlin. The fact that Java is supported by the vast majority of IDEs, including Android Studio (which we are using for this project) strengthens the case for using it in this project.

## **2.5 Persistence** – json/MySQL

**2.5.1 Json:** Introduced in the ICT Skills Module, json persistence has been a common feature of many assignments since and one that I am most familiar with. It's compact style, quick parsing speed and it's straightforward and readable nature are perfect for this project

**2.5.2 MySQL:** This is another element of the project that I have become familiar with through my work on the Databases module of Semester Two.

## **2.5.3 UI layer** – HTML5/CSS/Handlebars

In my role as a Web Developer with Kerry County Council and cemented further by lectures, labs and assignments completed throughout this course my knowledge of HTML5 and CSS has developed further and is an integral part of the development of this application.

## 2.6 System Analysis and Design

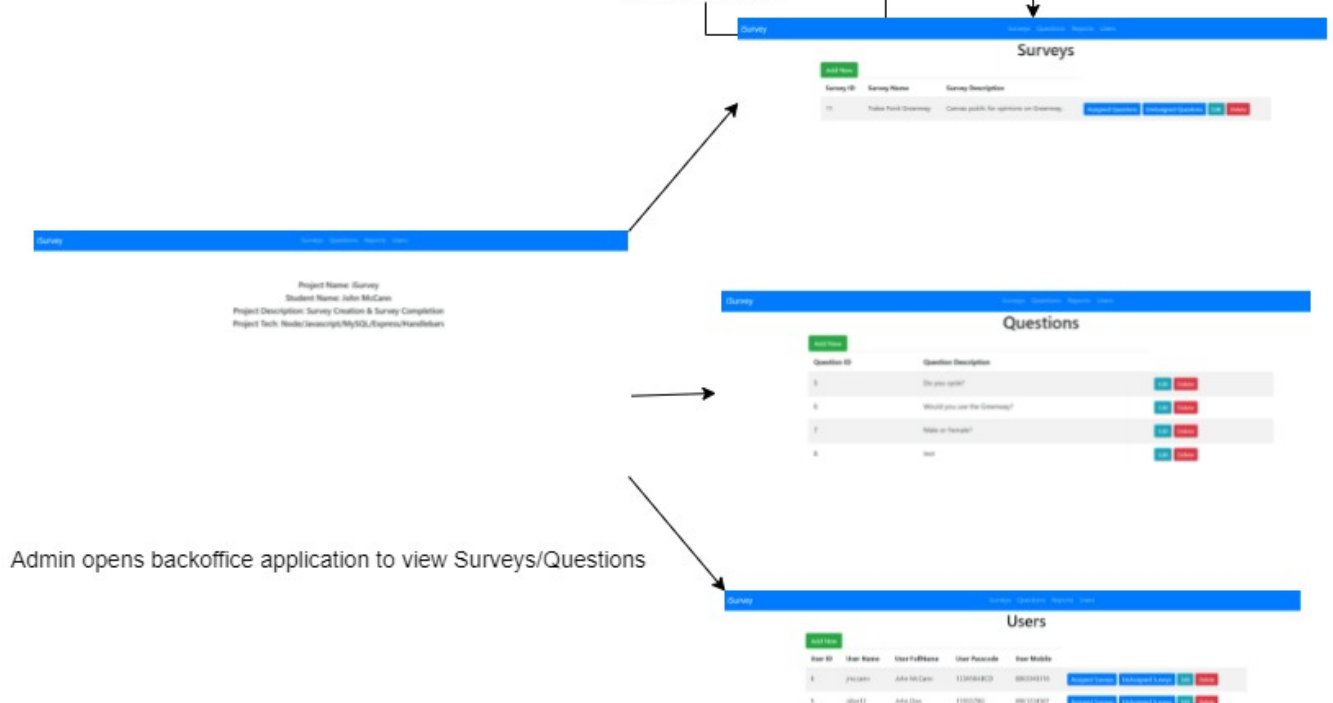
### 2.6.1 User stories

#	Location	Function	Result
US1	Back Office	Login	User is logged into back office and ready to access system.
US1.1	Back Office	Create Survey	User can create a new survey.
US1.2	Back Office	Create Questions	Questions can now be added by the User
US1.3	Back Office	Assign Questions to Survey	Created questions can now be assigned to a particular survey
US1.5	Back Office	Un-assign Questions to Survey	Created questions can also be removed/unassigned from a particular survey
US1.4	Back Office	Edit Survey	User can edit Survey title
US1.5	Back Office	Edit Questions	Questions can be edited by User
US1.6	Back Office	Delete Questions	Questions can be removed from system
US1.7	Back Office	Create User	User can create end-user
US1.8	Back Office	Edit User	User can edit End-user details
US1.9	Back Office	Delete User	User can remove end-user from system
US1.9.1	Back Office	Assign Survey to User	User can assign a particular survey to any end-user
US1.9.2	Back Office	Unassign Survey from User	User can un- assign survey from end-user
US1.9.3	Back Office	Process Survey Answers	User can report on survey answers
US2.1	Mobile	Download Surveys	User can download available surveys
US2.2	Mobile	List Surveys	User can access a list of surveys
US2.3	Mobile	Gather Answers	User can gather answers from particular surveys
US2.4	Mobile	Upload Completed Survey	User can upload a completed survey

## 2.6.2 Application Lifecycle & Functionality

### Lifecycle of iSurvey Application

#### Back-Office



- Administrators can:
- 1 Add Surveys and Questions
  2. Assign/unassign questions to survey
  - 3 View Reports of uploaded surveys.

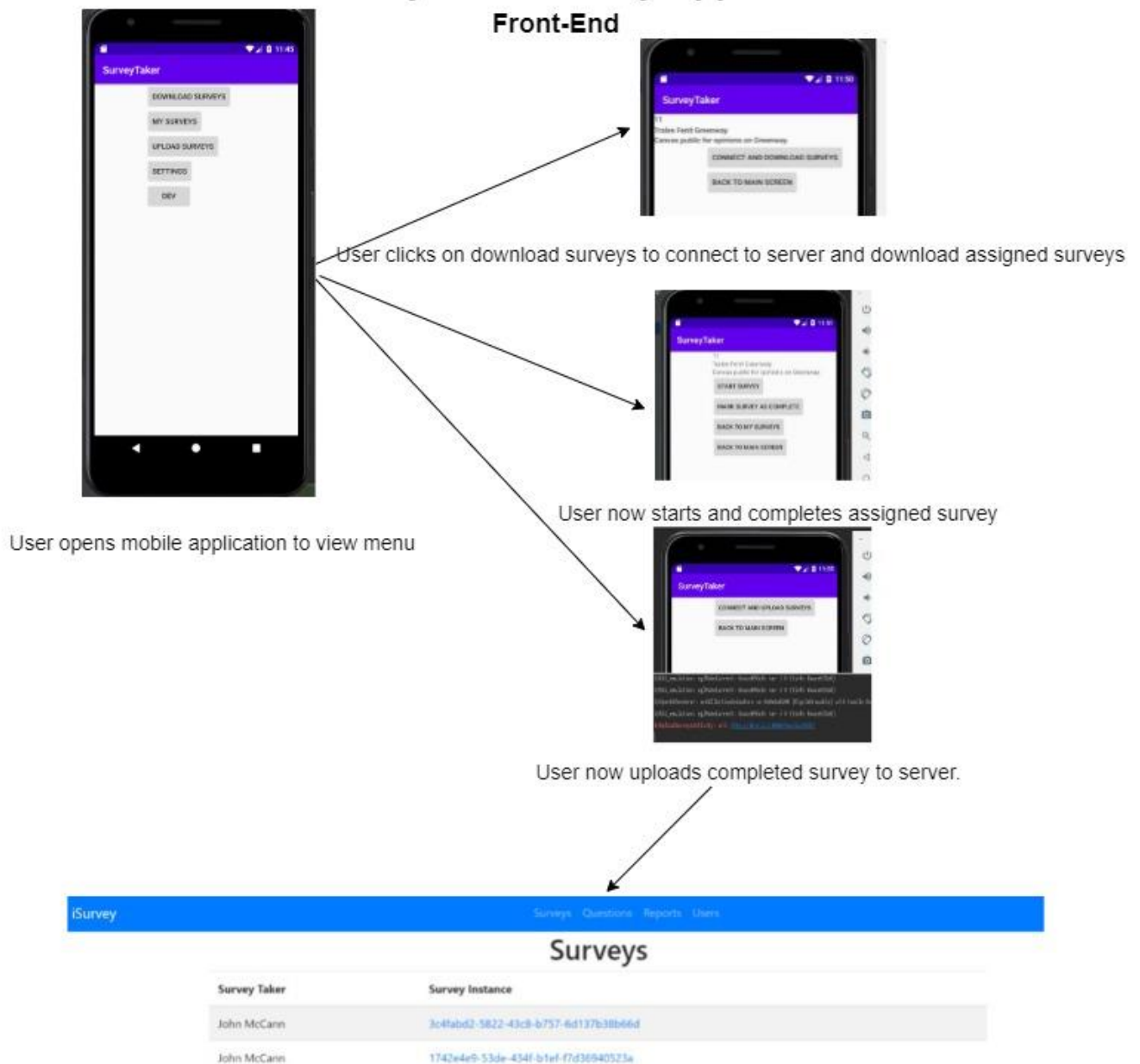
iSurvey			
Surveys Questions Reports Users			
Reports			
Survey ID	Survey Name	Survey Description	No. Of Surveys Taken
11	Tralee Fenit Greenway	Canvas public for opinions on Greenway.	2

Administrators can also view completed uploaded surveys from mobile application

Figure 2 - Lifecycle of iSurvey Application(Back Office)

# Lifecycle of iSurvey Application

## Front-End



Administrators can now view added completed uploaded survey from mobile application

Figure 3 - Lifecycle of iSurvey Application (Frontend)

### 2.6.3 Functional requirements –

The Back Office has the following functionality:

- Create Survey
- Create Questions
- Assign Questions to Survey
- Assign Survey to User
- Process Survey Answers

On the mobile side the functionality includes:

- Download Surveys
- List Surveys
- Gather Answers
- Upload Completed Survey
- Settings

### 2.6.4 Non-functional requirements

The non-functional requirements of this application include:

- Performance: The website's load time should not be more than one second for users.
- Availability: Users can access the application at any time during the day or night but due to the nature of the application this will only be required in working hours.
- Manageability: When editing the code for back office, the mobile and api stay up and running.
- Usability: The applications interface has to be user-friendly and easy to use.

### 3 Methodology

Methodology selection // For this project I will be using the Agile Model process. By breaking the product into cycles, the Agile model will enable me to deliver a working product such is realistic development approach. Throughout, I will produce ongoing releases, each with small, incremental changes from the previous release. At each iteration, the product will be tested. It is also a similar development approach that has served me well so far delivering assignments throughout this course and I am more comfortable with this approach.

Stage one involved the connection between the MySQL database and the node application as shown in [Figure 4](#) and [Figure 5](#) below

This stage after the initial set up, backend development also saw the mobile development at its initial stages with functionality around creating surveys, questions, users and assigning and unassigning those questions functioning correctly but with some work to be done to improve UI and user experience and compatibility. As the project progressed, time was then spent on developing the mobile application using Android Studio and ensuring complete functionality from start to finish. Finally, the ui of the mobile application was improved to a more aesthetically pleasing and easy to use app and after rigorous testing, the complete application was ready for submission.

### 3.1 Process outline

The process will be broken into fortnightly sprints which begins with the initial set up and ends with mobile data integration as shown in the table below:

#	Goal	Process	Task	Deadline
PO1	Set Up	Configure development environment . Initialise project for node.js. Install dependencies (express, MySQL, hbs) Initial commit in github	Install VS Code Install MySQL Install SQL Workbench Install Node.js Initialise project for Node.js Install handlebars (express, handlebars, mysql) Install Android Studio Initial commit in github	15/01/2021
PO2	Backend Development	Creation of tables and API	Create isurvey MySQL database Create surveys table Create questions table Create users table Create reports table Create surveys CRUD API in index.js Create questions CRUD API in index.js Create users CRUD API in index.js Create Reports display only API in index.js Commit to github  Create surveyquestions table Create surveyusers table Create surveyinstances table Create surveyquestions CRUD API in index.js Create surveyusers CRUD API in index.js Create surveyinstances CRUD API in index.js	29/01/2021
PO3	Frontend Development	Build html pages with handlebars, CSS and bootstrap	Build handlebars application structure (header, main, footer, partials, css) Build surveys hbs - modal popups etc Build questions hbs - modal popups etc Build users hbs - modal popups etc Build reports hbs - modal popups etc  Build surveyquestions hbs - modal popups etc Build surveyusers hbs - modal popups etc Build surveyinstances hbs - modal popups etc	13/02/21
PO4	Mobile Backend Development	Build REST API to be called from Java on mobile device	Build API for authentication based on user id and passcode from mobile device Build API to query backoffice database for user surveys as JSON Build API to receive survey data from mobile device as JSON	28/03/21

PO5	Mobile Frontend Development	Build activities and configure SQLite	Build activity for user settings to store user id, passcode and network url Build activity for querying network db via API Build activity for displaying surveys in list Build activity for displaying survey questions in list Build activity for displaying question and textbox for answer Build activity to store answers etc in local SQLite database Build activity for completing survey Build activity for calling API to send survey data	07/04/21
PO6	Mobile Data Integration	Code SQLite and REST API integration	Build activity for calling API to send survey data from local SQLite as JSON	22/04/21

## 4 Implementation

### 4.1 Sprint 1 - Installation of initial software

4.1.1 **Sprint Planning** : This phase involved the installation of software for the back office development of the project as well as setting up a git hub repository for use throughout.

4.1.2 **Sprint Review**: Installing of VS Code, MySQL and SQL Workbench. This sprint also involved installing and initializing the project for Node.js. Handlebars (express, handlebars, MySQL) was also installed. At this point also for the front end development stage Android studio was installed. Finally a git hub repository was established for use throughout development of the project.

4.1.3 **Sprint Evaluation**: All installs went well and it was a relief to get the project off the ground after months of planning and to start the development journey that hopefully leads to a useful, interesting and efficient application.

4.1.4 **Personal Reflection**: Knowledge and experience gained over two years in the HDip in Computer Science at WIT made this stage of development straight forward and seamless with the unavoidable challenges to come at a later stage of development.

### 4.2 Sprint 2 - Creation of tables and api

4.2.1 **Sprint Planning**: This phase involved the creation of tables and API in the second step of back office development. See [Figure 8](#)



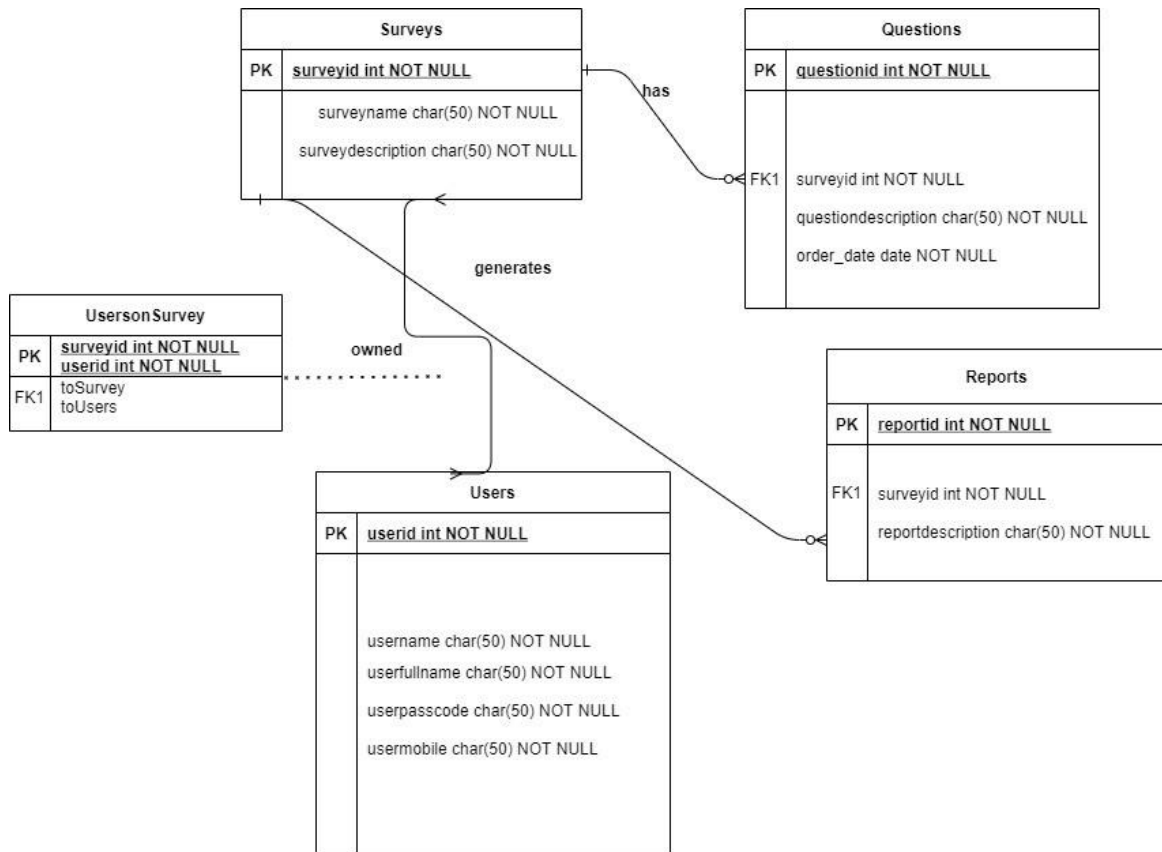


Figure 4 - ER Diagram

**4.2.2 Sprint Review:** This stage firstly involved creating the isurvey MySQL database and subsequently associated surveys, questions, users and reports tables. The surveys, questions and users CRUD API was then created in index.js. The reports display only API in index.js was then created and at this point all development was committed to git hub repository.

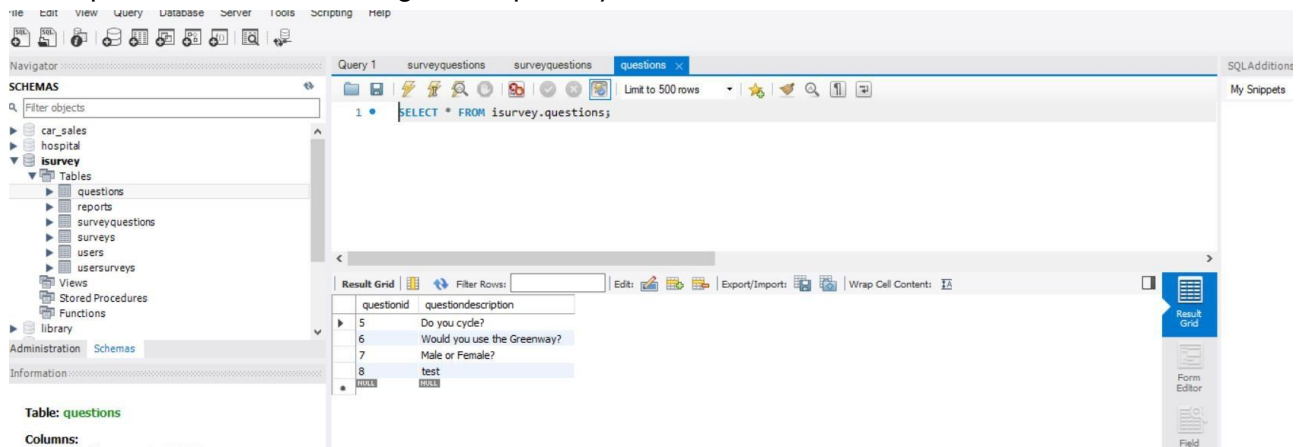


Figure 5 - iSurvey Database (MySQL)

**4.2.3 Sprint Evaluation:** After experiencing initial teething problems with the version of MySQL running on my local machine, I decided to reinstall latest version of MySQL which resulted in a smooth transition and straight forward creation of tables required for this stage of the project. The surveys, questions and users CRUD API created in index.js caused no apparent problems.

**4.2.4 Personal Reflection:** MySQL issues were the first stumbling block of any type face in development so far but when a fairly obvious and simple solution this next initial step of project development was completed.

## 4.3 Sprint 3 – Frontend Development

**4.3.1 Sprint Planning:** This phase involved building html pages with handlebars, CSS and bootstrap

**4.3.2 Sprint Review:** Firstly I had to build the handlebars application structure (header, main, footer, partials, CSS) followed by the construction of the various hbs pages for surveys, questions, users and reports as well as their associated modal pop ups. I also constructed the surveyquestions and surveyusers hbs pages for use when questions are assigned to surveys and users. See Figure 6

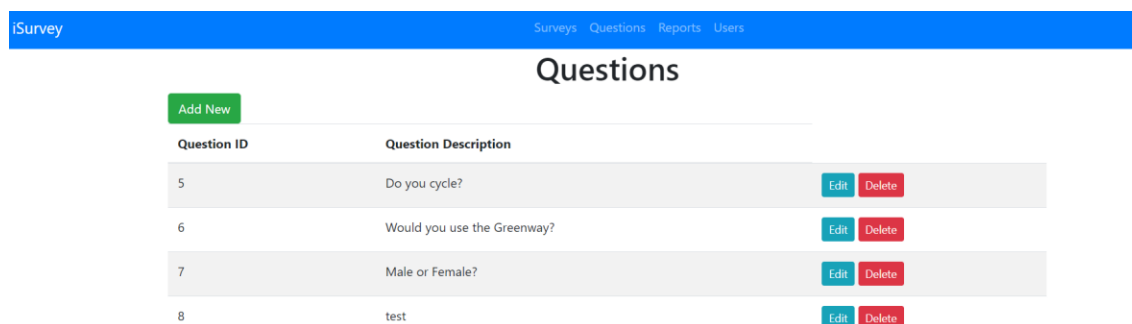


Figure 6 - handlebars application structure

**4.3.3 Sprint Evaluation:** There were some initial problems incorporating the CSS into the hbs pages to get the uniform design required but this step was resolved relatively easily to give the UI that is presented at this stage of development.

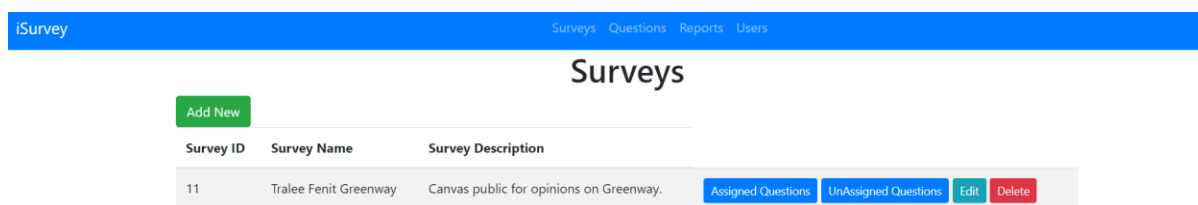


Figure 7 - enhanced ui development in backoffice

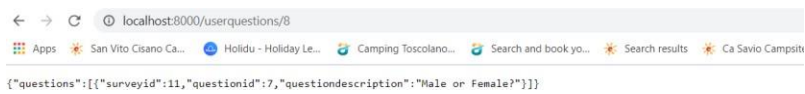
**4.3.4 Personal Reflection:** Another relatively small problem in relation to incorporating the CSS stylesheet for all hbs pages was overcome with a little research and experience acquired in the Web Development module of the HDip.

## 4.4 Sprint 4 - Mobile Backend Development

4.4.1 **Sprint Planning** : This phase involved the building of a REST API to be called from Java on mobile device. See Fig 8

4.4.2 **Sprint Review**: Building of API for authentication based on user id and passcode from mobile device, to query backoffice database for user surveys as JSON and to receive survey data from mobile device as JSON. Finally another git hub repository was established for use throughout development of the project.

4.4.3 **Sprint Evaluation**: All development at this stage went well aided in no small part in experience of first steps involving Visual Studio Code and to complete another step of development with relative ease built confidence that the project was moving in the right direction .



*Figure 8 - confirming api functionality*

4.4.4 **Personal Reflection**: The development of the first few sprints and experiences encountered made this stage of development relatively problem free and seamless with the more challenging obstacles to come later on in development .

## 4.5 Sprint 5 – Mobile Frontend Development

4.5.1 **Sprint Planning** : This phase involved the building of a mobile application including activities within android studio and the use of SQLite.

4.5.2 **Sprint Review**: This sprint included the building of activities for user settings to store user id, passcode and network url, for querying network db via API, for displaying surveys in list, for displaying survey questions in list, for displaying question and textbox for answer, to store answers etc in local SQLite database, for completing surveys and for calling API to send survey data. Finally another git hub repository containing code generated in this step was established for use throughout development of the project.

4.5.3 **Sprint Evaluation**: Mobile Development has been the toughest stage of development to date. Android Studio and Windows are not the best of friends at the best of times and the software constantly crashed causing great frustration. Also my knowledge of Kotlin would not be as advanced as my knowledge of Java, therefore I chose to build this application using Java. Once over the initial teething problems I have now established a very basic mobile application that can store information in local SQLite db



Figure 9 - mobile application

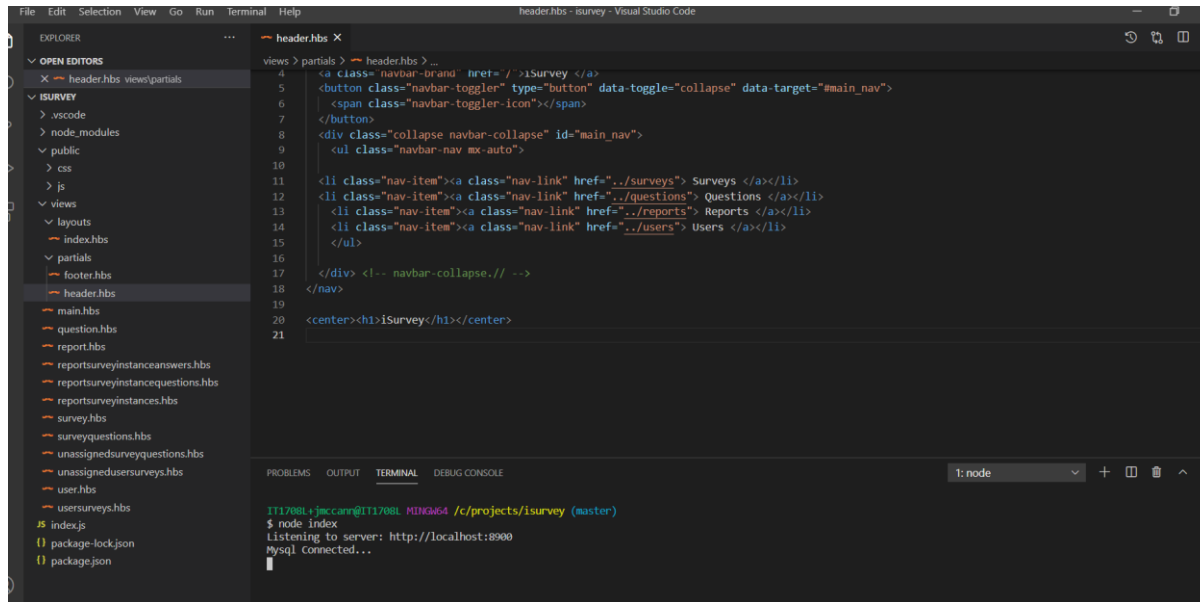
4.5.4 **Personal Reflection**: Problems with Android Studio have not been uncommon throughout this course but as the chief goal of this project is to develop a mobile application it was a step I had to endure and finally achieved to a certain level a working app that stored information in a local SQLite database. The switch from Kotlin to Java as the language used in development also aided the pace in which this application was developed.

## 5 iSurvey Userguide:

The following is a simple userguide on how iSurvey works, starting with the Back Office

### 5.1 BackOffice

Firstly start the back office application in Visual Studio Code and click on the link provided



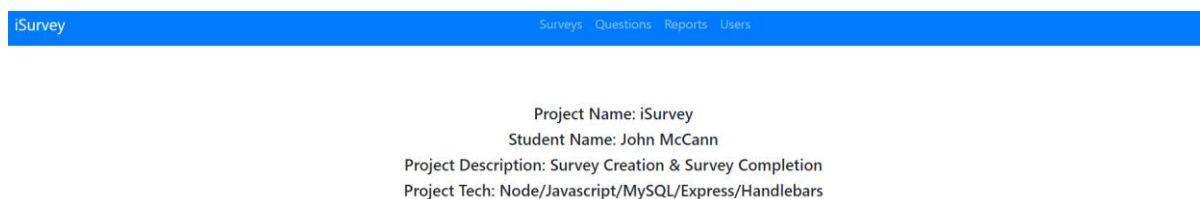
The screenshot shows the Visual Studio Code interface with the Explorer sidebar on the left displaying the project structure. The main editor area shows the `header.hbs` file with the following content:

```
4 <a class="navbar-brand" href="/ >iSurvey </a>
5 <button class="navbar-toggler" type="button" data-toggle="collapse" data-target="#main_nav">
6   <span class="navbar-toggler-icon"></span>
7 </button>
8 <div class="collapse navbar-collapse" id="main_nav">
9   <ul class="navbar-nav mx-auto">
10
11     <li class="nav-item"><a class="nav-link" href="/surveys"> Surveys </a></li>
12     <li class="nav-item"><a class="nav-link" href="/questions"> Questions </a></li>
13     <li class="nav-item"><a class="nav-link" href="/reports"> Reports </a></li>
14     <li class="nav-item"><a class="nav-link" href="/users"> Users </a></li>
15   </ul>
16 </div> <!-- navbar-collapse -->
17 </nav>
18
19 <center><h1>iSurvey</h1></center>
20
21
```

The bottom panel shows the Terminal with the following output:

```
IT1708L:jmcann@IT1708L: /c/projects/isurvey (master)
$ node index
Listening to server: http://localhost:8900
MySQL Connected...
```

The following web application should appear with projects details on the homepage as well as menu options on the top menu bar.

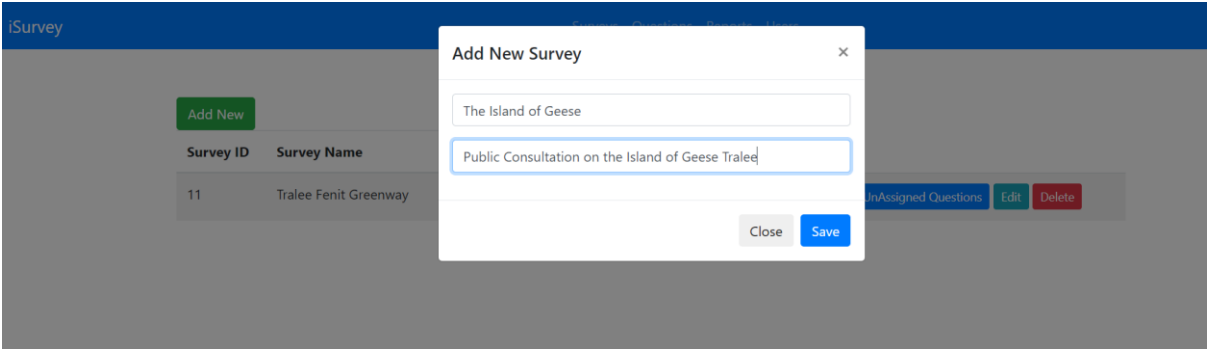


**Surveys:**

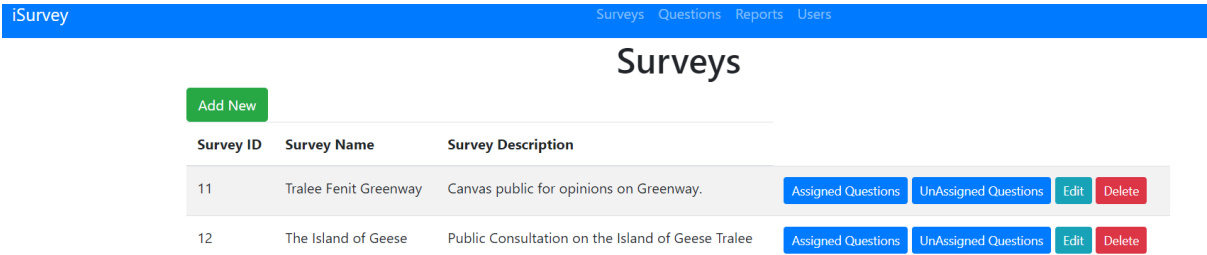
Clicking on the Surveys option will enable us to see the following screen which has details of current surveys available.



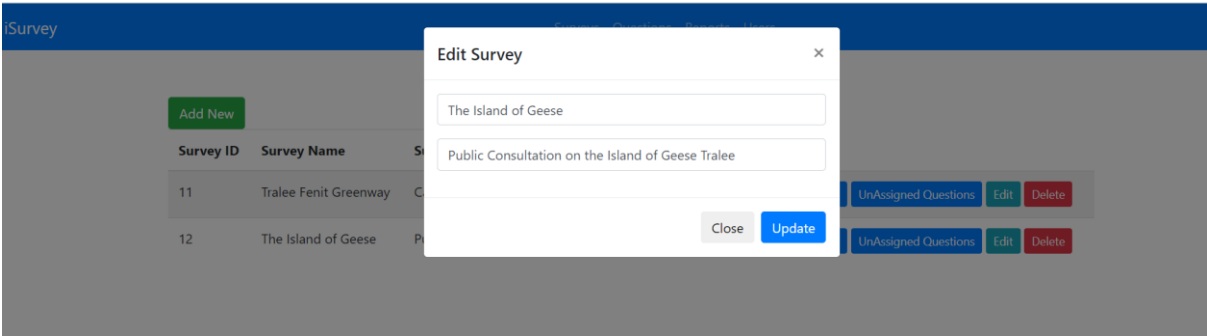
If required we can now add a new survey by clicking on add new button and the following pop up screen will appear which we can fill with Name and Description of Survey



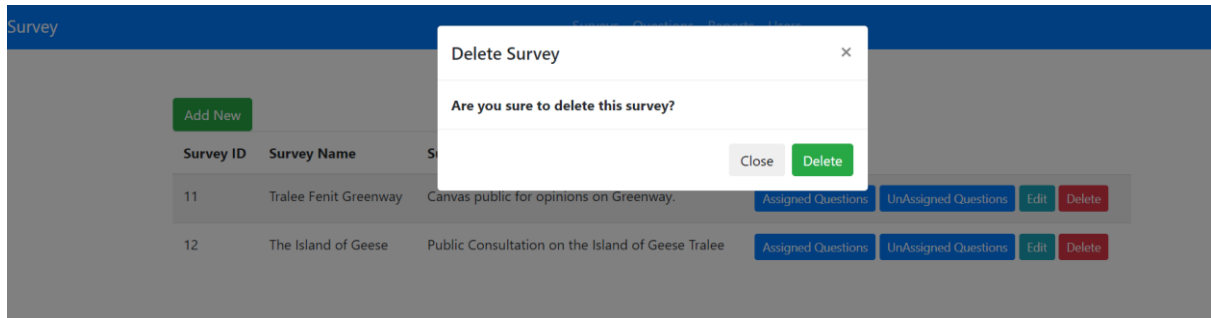
When added Survey should appear on screen as seen below.



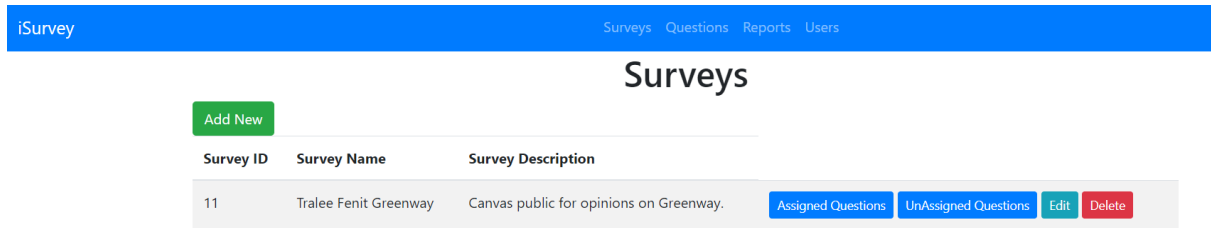
We also have the option of editing the survey by clicking on edit button which will show us this screen.



We can also delete the survey by clicking on delete which asks the user if they want to delete the survey.

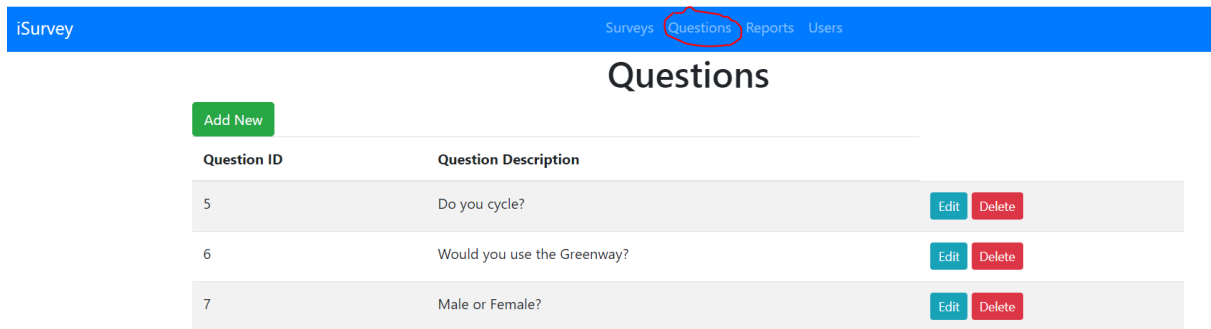


When delete is clicked we can see that the survey has now been removed.

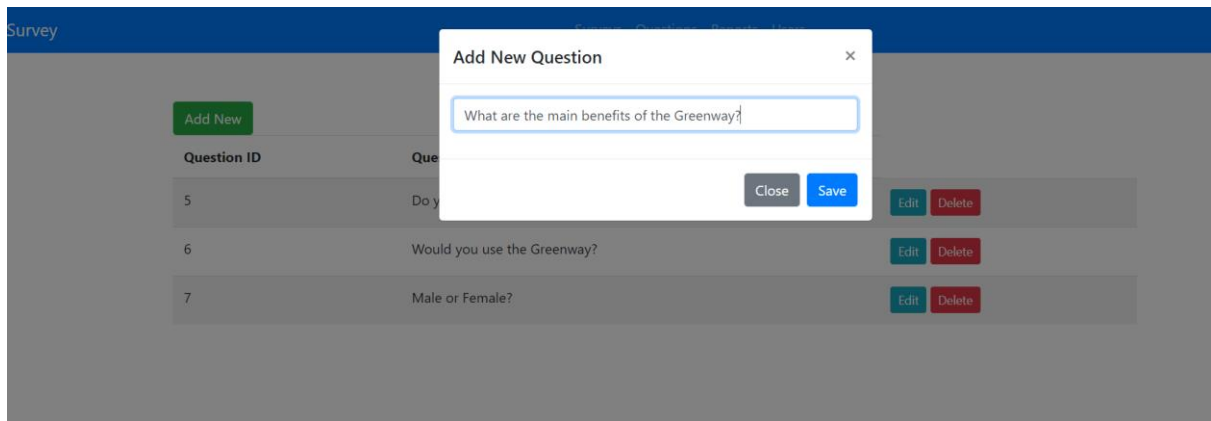


### Questions:

Clicking on the Questions option will enable us to see the following screen which has details of current questions available.



If required we can now add a new question by clicking on add new button and the following pop up screen will appear which we can fill with the Question description.



When added Question should appear on screen as seen below.

iSurvey

SurveysQuestionsReportsUsers

Questions

Add New

Question ID	Question Description	
5	Do you cycle?	<div>EditDelete</div>
6	Would you use the Greenway?	<div>EditDelete</div>
7	Male or Female?	<div>EditDelete</div>
10	What are the main benefits of the Greenway?	<div>EditDelete</div>

We also have the option of editing the questions by clicking on edit button which will show us this screen.

iSurvey

SurveysQuestionsReportsUsers

Add New

Question ID	Question Description	
5	Do you cycle?	<div>EditDelete</div>
6	Would you use the Greenway?	<div>EditDelete</div>
7	Male or Female?	<div>EditDelete</div>
10	What are the main benefits of the Greenway?	<div>EditDelete</div>

Edit Question

What are the main benefits of the Greenway?

Close

Update

We can also delete the question by clicking on delete which asks the user if they want to delete the question.

iSurvey

SurveysQuestionsReportsUsers

Add New

Question ID	Question Description	
5	Do you cycle?	<div>EditDelete</div>
6	Would you use the Greenway?	<div>EditDelete</div>
7	Male or Female?	<div>EditDelete</div>
10	What are the main benefits of the Greenway?	<div>EditDelete</div>

Delete Question

Are you sure to delete this question?

Close

Delete



When delete is clicked we can see that the question has now been removed.

iSurvey

SurveysQuestionsReportsUsers

Questions

Add New

Question ID	Question Description	
5	Do you cycle?	<div>EditDelete</div>
6	Would you use the Greenway?	<div>EditDelete</div>
7	Male or Female?	<div>EditDelete</div>

Assigning Questions to Surveys:

We can also assign questions to particular surveys by firstly clicking on unassigned questions.

iSurvey

SurveysQuestionsReportsUsers

Surveys

Add New

Survey ID	Survey Name	Survey Description	
11	Tralee Fenit Greenway	Canvas public for opinions on Greenway.	<div>Assigned QuestionsUnAssigned QuestionsEditDelete</div>

This will give the user a list of unassigned questions. To assign this question to our survey created we simply click the assign button.

iSurvey

SurveysQuestionsReportsUsers

UnAssigned Survey Questions

Survey ID	Question ID	Question Description	
11	7	Male or Female?	<div>Assign</div>

We are then prompted as to check if we want to assign this question to our survey.

iSurvey

SurveysQuestionsReportsUsers

UnAssigned Survey Questions

Assign Question

Are you sure to assign this question?

Close

Assign

11	7		<div>Assign</div>
----	---	--	-------------------

On clicking assign, we notice that the question has left the unassigned questions screen.

iSurvey

SurveysQuestionsReportsUsers

UnAssigned Survey Questions

Survey ID	Question ID	Question Description
-----------	-------------	----------------------

And is now added to our survey.

iSurvey			
Surveys Questions Reports Users			
Assigned Survey Questions			
Survey ID	Question ID	Question Description	
11	5	Do you cycle?	UnAssign
11	6	Would you use the Greenway?	UnAssign
11	7	Male or Female?	UnAssign

If we want to unassign this question we click on unassign button.

iSurvey			
Surveys Questions Reports Users			
Assigned Survey Questions			
Survey ID	Question ID	Question Description	
11	5	Do you cycle?	UnAssign
11	6	Would you use the Greenway?	UnAssign
11	7	Male or Female?	UnAssign

Again we are prompted to check if this the desired action we wish to take.

iSurvey			
Surveys Questions Reports Users			
Assigned Survey Questions			
Survey ID	Question ID	Question Description	
11	5	Do you cycle?	UnAssign
11	6	Would you use the Greenway?	UnAssign
11	7	Male or Female?	UnAssign

By clicking Unassign the question now disappears from assigned survey.

iSurvey			
Surveys Questions Reports Users			
Assigned Survey Questions			
Survey ID	Question ID	Question Description	
11	5	Do you cycle?	UnAssign
11	6	Would you use the Greenway?	UnAssign

And is present again in the unassigned questions list.

iSurvey

SurveysQuestionsReportsUsers

UnAssigned Survey Questions

Survey ID	Question ID	Question Description	
11	7	Male or Female?	<div>Assign</div>

Users:

Clicking on the Users option will enable us to see the following screen which has details of current users available.

iSurvey

SurveysQuestionsReportsUsers

Users

Add New

User ID	User Name	User FullName	User Passcode	User Mobile	
8	jmccann	John McCann	123456ABCD	0863343316	<div>Assigned Surveys</div> <div>UnAssigned Surveys</div> <div>Edit</div> <div>Delete</div>
9	Jdoe12	John Doe	159357BG	0861234567	<div>Assigned Surveys</div> <div>UnAssigned Surveys</div> <div>Edit</div> <div>Delete</div>

If required we can now add a new user by clicking on add new button and the following pop up screen will appear which we can fill with User Name, User Fullname, User Passcode and User Mobile.

Survey

SurveysQuestionsReportsUsers

Add New

User ID	User Name	User FullN
8	jmccann	John McCa
9	Jdoe12	John Doe

Add New User

dmccann

Daire McCann

2698766DM

0857362846

Close

Save

When added User should appear on screen as seen below.

iSurvey

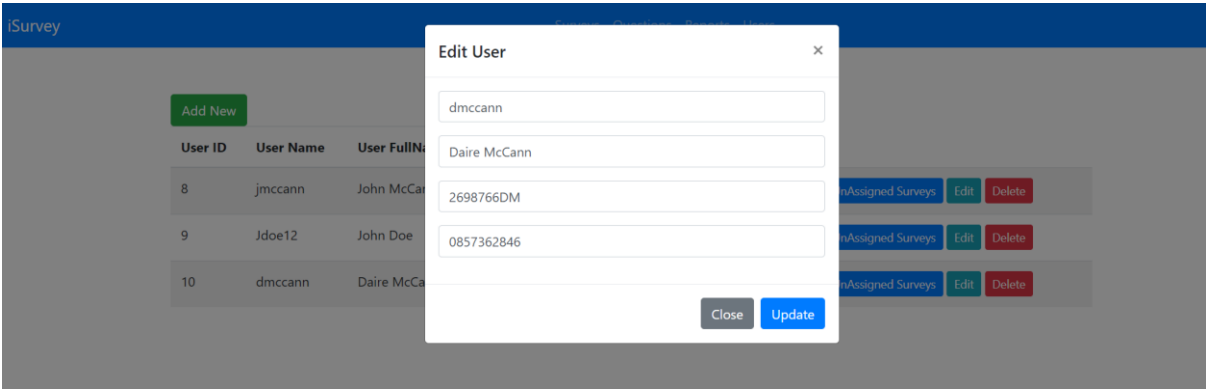
SurveysQuestionsReportsUsers

Users

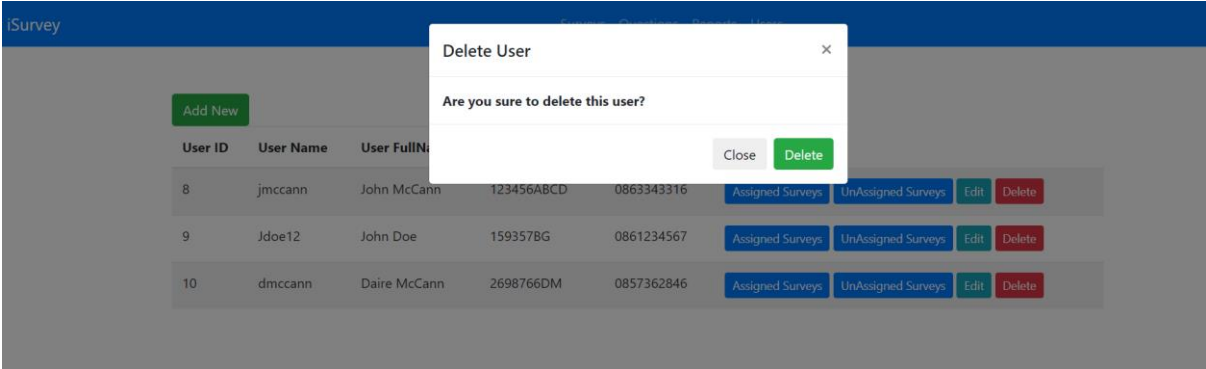
Add New

User ID	User Name	User FullName	User Passcode	User Mobile	
8	jmccann	John McCann	123456ABCD	0863343316	<div>Assigned Surveys</div> <div>UnAssigned Surveys</div> <div>Edit</div> <div>Delete</div>
9	Jdoe12	John Doe	159357BG	0861234567	<div>Assigned Surveys</div> <div>UnAssigned Surveys</div> <div>Edit</div> <div>Delete</div>
10	dmccann	Daire McCann	2698766DM	0857362846	<div>Assigned Surveys</div> <div>UnAssigned Surveys</div> <div>Edit</div> <div>Delete</div>

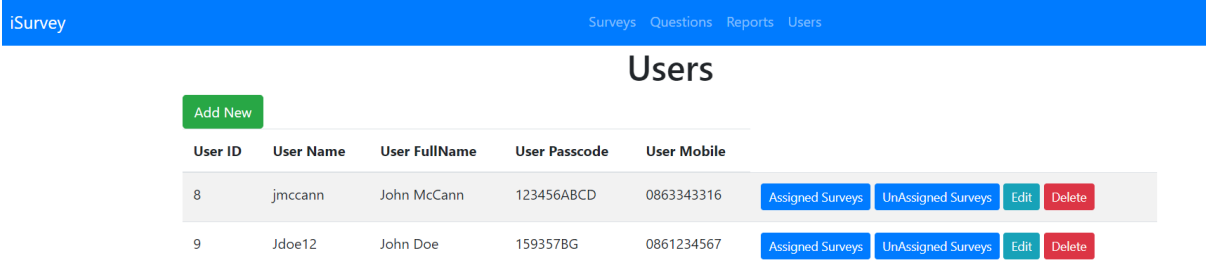
We also have the option of editing the user details by clicking on edit button which will show us this screen.



We can also delete the user by clicking on delete which asks the user if they want to delete the user.



When delete is clicked we can see that the user has now been removed.



**Assigning to Surveys to Users:**

We can also assign surveys to particular users by firstly clicking on unassigned surveys in the list of users as shown below.

iSurvey

SurveysQuestionsReportsUsers

Users

Add New

User ID	User Name	User FullName	User Passcode	User Mobile	
8	jmccann	John McCann	123456ABCD	0863343316	<div>Assigned SurveysUnAssigned SurveysEditDelete</div>
9	Jdoe12	John Doe	159357BG	0861234567	<div>Assigned SurveysUnAssigned SurveysEditDelete</div>

This will show a list of unassigned surveys to this particular user ( in this case, Jdoe12).

iSurvey

SurveysQuestionsReportsUsers

UnAssigned User Surveys

User ID	Survey ID	Survey Name	
9	11	Tralee Fenit Greenway	<div>Assign</div>

By clicking on assign button we can assign the relevant survey to this user and it now the Unassigned User Survey screen is blank as all surveys have been assigned to users.

iSurvey

SurveysQuestionsReportsUsers

UnAssigned User Surveys

User ID	Survey ID	Survey Name
---------	-----------	-------------

If we now return to our users page and click on assigned surveys for this particular user.

iSurvey

SurveysQuestionsReportsUsers

Users

Add New

User ID	User Name	User FullName	User Passcode	User Mobile	
8	jmccann	John McCann	123456ABCD	0863343316	<div>Assigned SurveysUnAssigned SurveysEditDelete</div>
9	Jdoe12	John Doe	159357BG	0861234567	<div>Assigned SurveysUnAssigned SurveysEditDelete</div>

We can see that this survey has indeed been assigned to this particular user.

iSurvey

SurveysQuestionsReportsUsers

Assigned User Surveys

User ID	Survey ID	Survey Name	
9	11	Tralee Fenit Greenway	UnAssign

If we want to unassign this survey from the user we click on unassign button.

iSurvey

SurveysQuestionsReportsUsers

Assigned User Surveys

User ID	Survey ID	Survey Name	
9	11	Tralee Fenit Greenway	UnAssign

Again we are prompted to check if this the desired action we wish to take.

Survey

Unassign Survey

Are you sure to unassign this survey?

CloseUnAssign

User ID	Survey ID	
9	11	UnAssign

By clicking Unassign the survey now disappears from users assigned surveys.

iSurvey

SurveysQuestionsReportsUsers

Assigned User Surveys

User ID	Survey ID	Survey Name
---------	-----------	-------------

## Reports

Clicking on the Reports option will enable us to see the following screen which has details of current surveys.

iSurvey			
Surveys Questions Reports Users			
Reports			
Survey ID	Survey Name	Survey Description	No. Of Surveys Taken
11	Tralee Fenit Greenway	Canvas public for opinions on Greenway.	6

We can view ID, Name, Description and No. of Surveys Taken in this screen and by clicking on no. of surveys taken we can now view details of user who took survey and survey instance.

## Surveys

Survey Taker	Survey Instance
John McCann	<a href="#">3c4fabd2-5822-43c8-b757-6d137b38b66d</a>
John McCann	<a href="#">1742e4e9-53de-434f-b1ef-f7d36940523a</a>
John McCann	<a href="#">5a5be591-0d16-4f4e-bd91-bdae01757a5b</a>
John McCann	<a href="#">6e4b603e-16de-4e46-9545-e3d6237bc156</a>
John McCann	<a href="#">7c3ae4eb-ffe0-4fc4-ab9b-7e2d499ee374</a>
John McCann	<a href="#">4b413cc6-e253-4933-9504-5b97ecb85b58</a>

By clicking on the survey instance we can also view the particular questions asked.

## Questions

Question	
Do you cycle?	<a href="#">Answer</a>
Would you use the Greenway?	<a href="#">Answer</a>

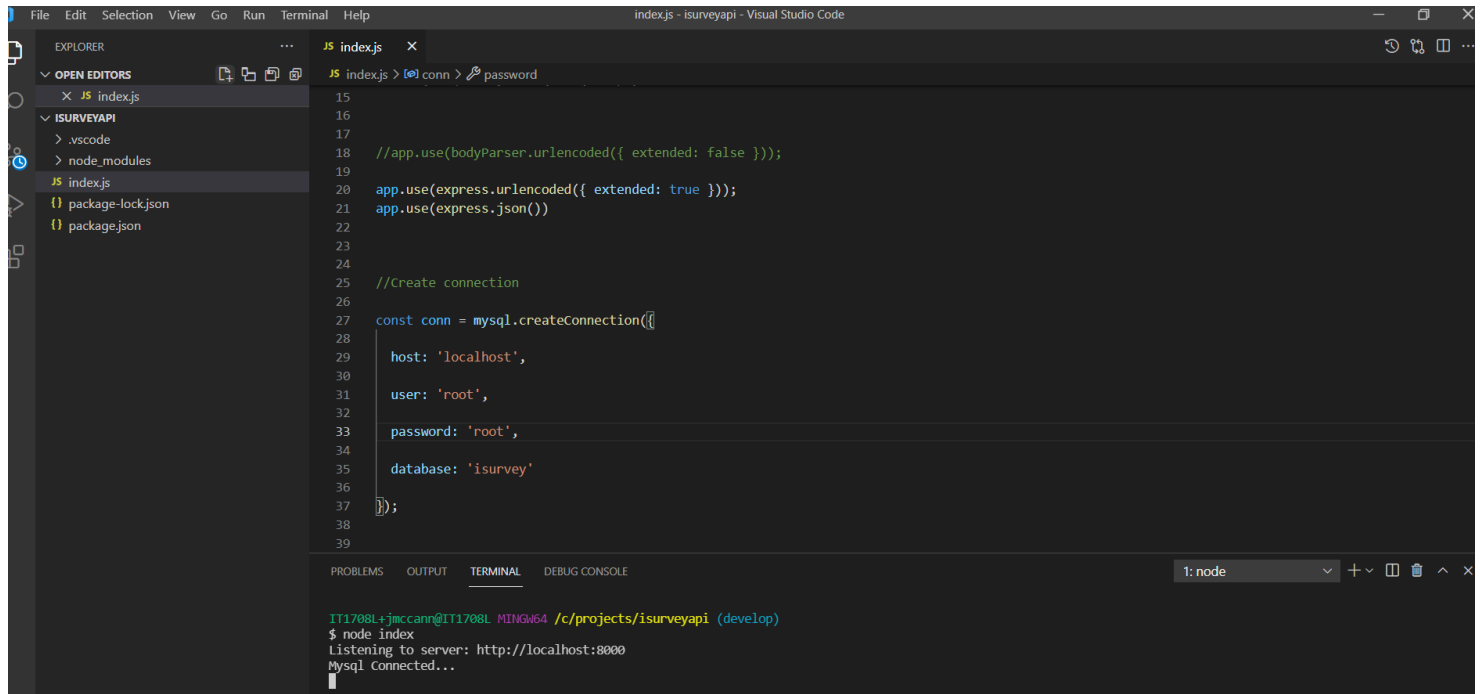
Furthermore we can click on the answers to investigate the answers given to each question.

## Answers

Answer
Yes

## 5.2 Mobile /API

Firstly start the survey api application in Visual Studio Code

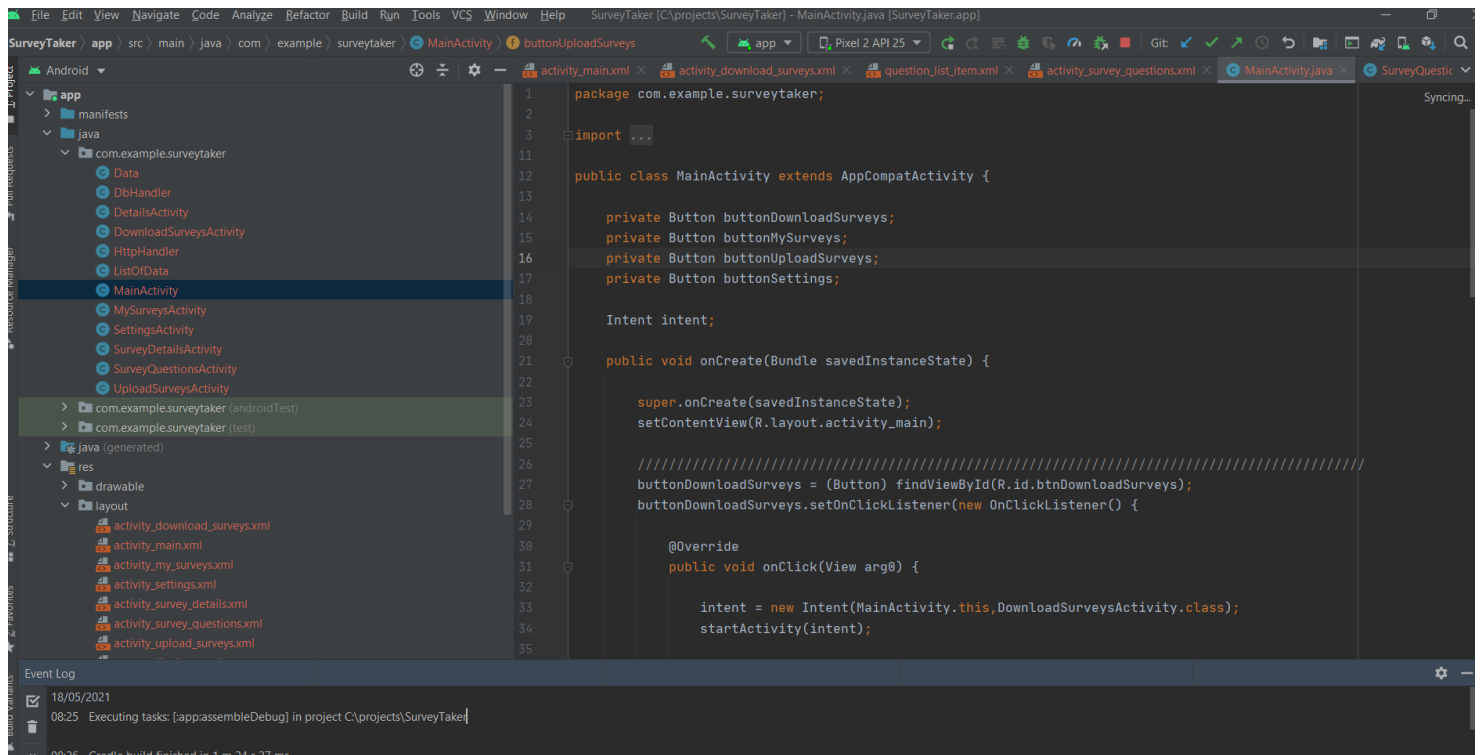


The screenshot shows the Visual Studio Code interface with the 'index.js' file open in the editor. The file contains JavaScript code for setting up an Express server and connecting to a MySQL database. The terminal at the bottom shows the command 'node index' being executed, resulting in the server listening on http://localhost:8000 and the MySQL connection being established.

```
15
16
17
18 //app.use(bodyParser.urlencoded({ extended: false }));
19
20 app.use(express.urlencoded({ extended: true }));
21 app.use(express.json())
22
23
24
25 //Create connection
26
27 const conn = mysql.createConnection({
28
29   host: 'localhost',
30
31   user: 'root',
32
33   password: 'root',
34
35   database: 'survey'
36
37 });
38
39
```

```
IT1708L+jmccann@IT1708L MINGW64 /c/projects/isurveyapi (develop)
$ node index
Listening to server: http://localhost:8000
Mysql Connected...
```

Now, start app on android studio.



The screenshot shows the Android Studio interface with the 'MainActivity.java' file open in the editor. The file contains Java code for the main activity, including imports, class declaration, and the onCreate method. The project structure is visible in the left sidebar, showing the 'app' directory and its contents.

```
1 package com.example.surveytaker;
2
3 import ...
4
5
6
7
8
9
10
11
12 public class MainActivity extends AppCompatActivity {
13
14   private Button buttonDownloadSurveys;
15   private Button buttonMySurveys;
16   private Button buttonUploadSurveys;
17   private Button buttonSettings;
18
19   Intent intent;
20
21   public void onCreate(Bundle savedInstanceState) {
22
23     super.onCreate(savedInstanceState);
24     setContentView(R.layout.activity_main);
25
26     ///////////////////////////////////////////////////
27     buttonDownloadSurveys = (Button) findViewById(R.id.btnDownloadSurveys);
28     buttonDownloadSurveys.setOnClickListener(new OnClickListener() {
29
30
31       @Override
32       public void onClick(View arg0) {
33
34         intent = new Intent(MainActivity.this, DownloadSurveysActivity.class);
35         startActivity(intent);
36       }
37     });
38   }
39 }
```



The following main screen should appear on the emulator

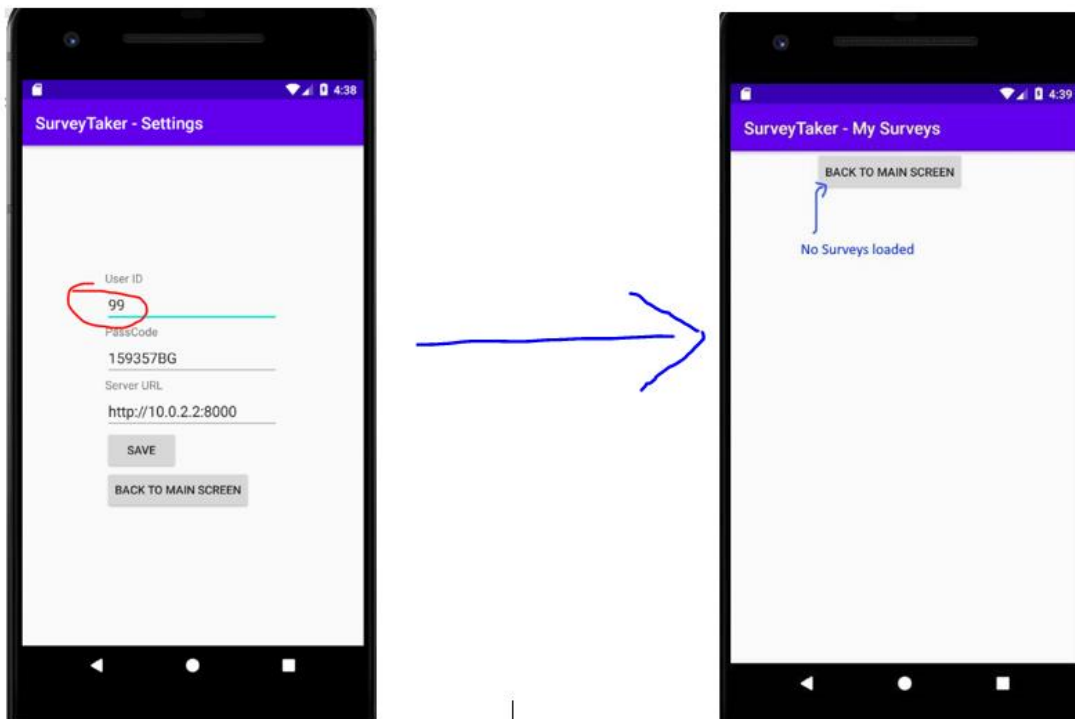


The user can click the settings button and the following screen will appear. This screen enables the user to enter user ID, specific passcode and server url as shown previously in back office application.

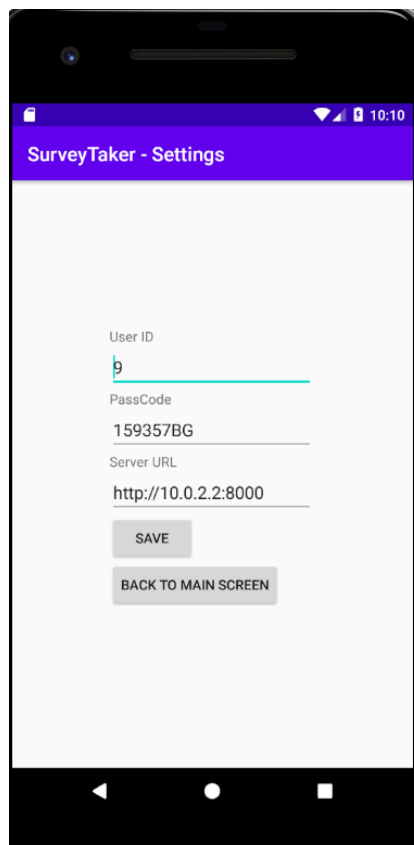
Add New

User ID	User Name	User FullName	User Passcode	User Mobile	
8	jmccann	John McCann	123456ABCD	0863343316	<div>Assigned Surveys</div> <div>UnAssigned Surveys</div> <div>Edit</div> <div>Delete</div>
9	Jdoe12	John Doe	159357BG	0861234567	<div>Assigned Surveys</div> <div>UnAssigned Surveys</div> <div>Edit</div> <div>Delete</div>

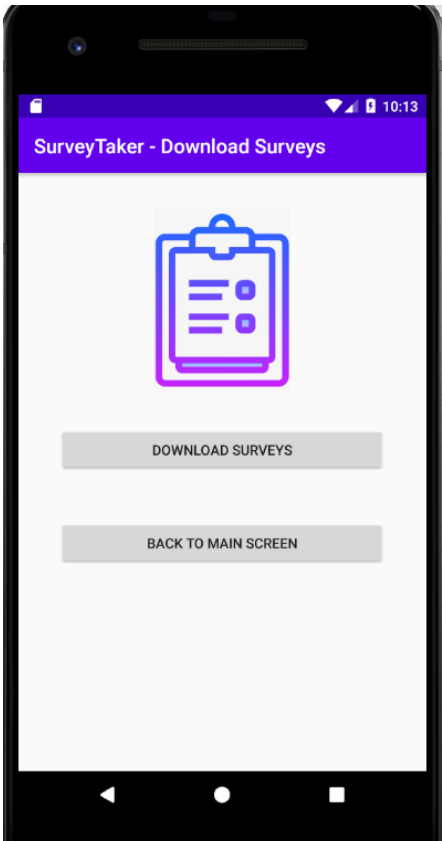
If any of these details are incorrect the mobile app will be unable to communicate with the backoffice.



With correct details entered as below we can now access our surveys. This passcode/userID combination enables security to the application and unless the user has these correct details they will be unable to access the backoffice data.



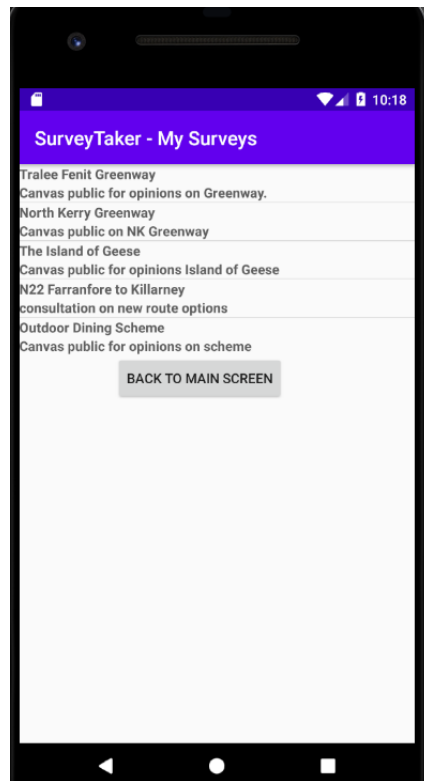
Once these details are entered the user can return to main screen and hit the download surveys button which will show the following screen.



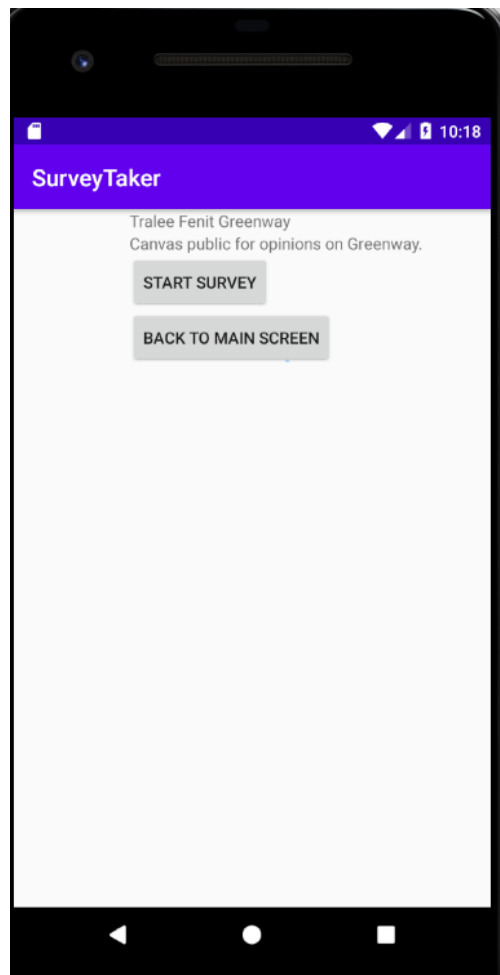
When user clicks on download surveys button the following message should appear – informing the user that their associated surveys (see back office) are downloaded , at which point the user can again return to main screen.



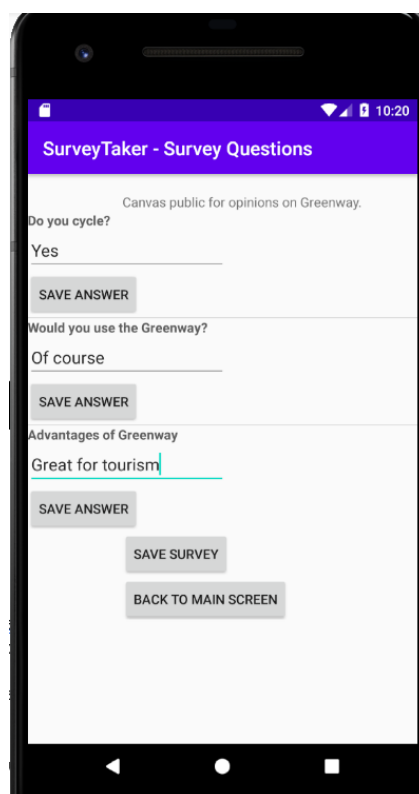
If the user now clicks on the my surveys button on the main screen, the following screen should appear, showing the surveys assigned to that particular user.



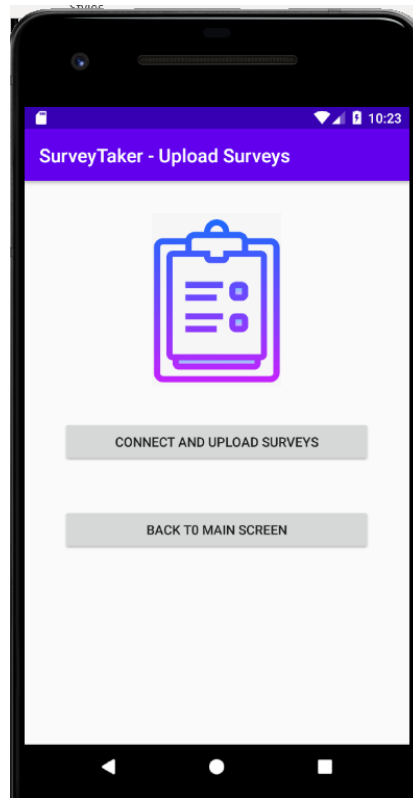
The user can now click on the survey they require to bring them to the screen shown below.



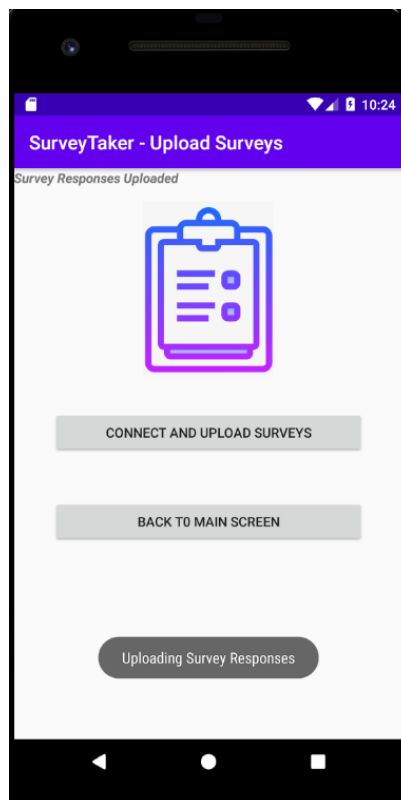
To begin survey the user simply clicks on start survey and the following screen will appear.



User then fills in details, saves survey and returns to main screen. To upload the completed survey to the back office the user clicks on upload surveys which brings them to screen shown below.



The user then clicks on the connect and upload surveys button on screen and the following message appears.



We can now check the back office application to see if this survey have been uploaded.

iSurvey <span>Surveys Questions Reports Users</span>				
Reports				
Survey ID	Survey Name	Survey Description	Survey Details	No. Of Surveys Taken
11	Tralee Fenit Greenway	Canvas public for opinions on Greenway.	<a href="#">Click Here</a>	12

We can see the survey added to our list as per screen shot below.

iSurvey <span>Surveys Questions Reports Users</span>	
Survey Taker	Survey Instance
John McCann	3c4fabd2-5822-43c8-b757-6d137b38b66d
John McCann	1742e4e9-53de-434f-b1ef-f7d36940523a
John McCann	5a5be591-0d16-4f4e-bd91-bdae01757a5b
John McCann	6e4b603e-16de-4e46-9545-e3d6237bc156
John McCann	7c3ae4eb-ffe0-4fc4-ab9b-7e2d499ee374
John McCann	4b413cc6-e253-4933-9504-5b97ecb85b58
John Doe	996b7f1f-d4af-48d2-936d-a134501d26aa
John Doe	0b3386a7-60d1-492a-b071-96013d6c0763
John Doe	a219937e-65e7-47b6-92ac-7eba3abb1ee3
John Doe	5278b53f-7b7a-43e2-98c7-6b1b690d5a4e
John Doe	02731614-7671-4ab8-aab8-9329a63171d8
John Doe	089cf047-a1d1-4c0b-97ce-67018d96ab7e

We can now drill down through the survey to check our answers.

iSurvey <span>Surveys Questions Reports Users</span>	
Questions	
Question	Answer
Do you cycle?	<a href="#">Answer</a>
Would you use the Greenway?	<a href="#">Answer</a>
Advantages of Greenway	<a href="#">Answer</a>

iSurvey <span>Surveys Questions Reports Users</span>	
Answers	
Answer	
Great for tourism	

## 6. Pitfalls & Solutions:

As is usually the case in development of any sort (especially on a part-time course) time constraints dictated a lot of the

application capabilities. Given more time this particular application would be capable of a lot more functionality.

Development obstacles, roadblocks and frustrations were also common along the way.

These included:

- Android Studio on a Windows machine with insufficient RAM was probably not the best idea as the constant crashing of the emulator and slow gradle building was often the cause of frustration.
- I also found sourcetree to be a program of similar frustration as it constantly crashed midway through some important commits to git which did not leave this developer best pleased!
- My knowledge of Kotlin may have been fine for the mobile development assignments but I felt my familiarity with Java suited me better for this project and when I finally committed to that change the mobile development part of this project took a marked turn in productivity and success.

## 7. Further Development:

- Hosting this application would be the obvious next step as this project demonstrates it's working locally.
- Even though I have taken some measures around security with a userid and passcode required to access the back office data ,I release that further security is secured to ensure this application is completely secure.
- The design would have benefitted from extra time to perhaps add a splash screen, login screen and make the application more aesthetically pleasing .
- Data Validation in the back office and mobile device is also an obvious requirement.

## 8 Summary

Using agile development methodology my aim from the beginning of this project was to achieve functionality first and foremost and then to embellish this application to become a more user-friendly experience. At the end of this point in development, I am satisfied that all functionality is completed to the level I had anticipated for submission. This was a project that had its inevitable ups and downs with the environments used to develop at times being very challenging (I'm looking at you Android Studio) but was ultimately a final project that I am very happy with and believe demonstrates the technological strides I have made since this course began. This course has introduced me to a vast amount of new systems and technologies that will undoubtedly benefit my career within the IT sector and a number of these are on display in this final project.

The timetable set out by Waterford IT was very beneficial for me in completing this project as I was focused to achieve deliverables along the way rather than being overloaded coming close to final deadline date.

This project began as a personal project but now has potential to be utilized within the organization that I work (Kerry County Council) which is an undoubted bonus.

A mention has to go to my extremely supportive and patient family, my wife Daire and children Ellie and Luke who have to endure the challenges that come with the HDip and have always been there with love and support! Thanks also to Rosanne Birney, whose advice and guidance was always sound and helped me focus on what was required and was of great help throughout the whole process.

To Brendan Hayes, whose knowledge, expertise and love of Android Studio helped me no end in getting to the finish line and for that I am eternally grateful!

Overall both this final project (and indeed the HDIP in general) have challenged and rewarded me in equal high measures and hopefully this project is a proper indication of the hard work and interest shown for the duration of the course.



## List of references

### Stackoverflow

- Kotlin vs Java - <https://stackoverflow.com/questions/45384786/what-is-better-for-android-application-development-is-it-kotlin-or-java/45384926>
- SQL lite - <https://stackoverflow.com/questions/tagged/sqlite>
- Android http - <https://stackoverflow.com/questions/tagged/android>
- Handlebars - <https://stackoverflow.com/tags/handlebars.js/info>
- SQLite Database handling - <https://stackoverflow.com/questions/12015731/android-sqlite-example>

W3 Schools - <https://www.w3schools.com/>

Tutorials Point - <https://www.tutorialspoint.com/index.htm>

# Appendices

## Appendix A –Github Repository for back office application

<https://github.com/jmccannbarrow/iSurveybackoffice>

jmccannbarrow / iSurveybackoffice

Unwatch 1 Star 0 Fork

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

master 3 branches 0 tags

Go to file Add file Code

jmccannbarrow Merge pull request #3 from jmccannbarrow/develop 6c41da9 6 days ago 6 commits

.vscode	first backoffice commit	20 days ago
node_modules	first backoffice commit	20 days ago
public	first backoffice commit	20 days ago
views	Feature01 - Reports and enabling user passcode in backoffice	6 days ago
index.js	Feature01 - Reports and enabling user passcode in backoffice	6 days ago
package-lock.json	first backoffice commit	20 days ago
package.json	first backoffice commit	20 days ago

Help people interested in this repository understand your project by adding a README. Add a README

About

No description, website, or topics provided.

Releases

No releases published  
Create a new release

Packages

No packages published  
Publish your first package

Languages

Handlebars 68.4% JavaScript 31.6%

## Appendix B –Github Repository for api

<https://github.com/jmccannbarrow/isurveyapi>

jmccannbarrow / isurveyapi

Unwatch 1 Star 0

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

master 5 branches 0 tags Go to file Add file Code

jmccannbarrow Merge pull request #7 from jmccannbarrow/develop 63c78a0 6 days ago 12 commits

.vscode	first api commit	last month
node_modules	first api commit	last month
index.js	Feature03 - add passcode functionality to api	6 days ago
package-lock.json	first api commit	last month
package.json	first api commit	last month

Help people interested in this repository understand your project by adding a README. Add a README

About No description, website, or topics provided.

Releases No releases published Create a new release

Packages No packages published Publish your first package

Languages JavaScript 100.0%

## Appendix C –Github Repository for mobile development

<https://github.com/jmccannbarrow/isurveymobile>

jmccannbarrow / isurveymobile

Unwatch 1 Star 0

<> Code Issues Pull requests 1 Actions Projects Wiki Security Insights Settings

master 3 branches 0 tags Go to file Add file Code

jmccannbarrow Merge pull request #1 from jmccannbarrow/feature1-removeddevsetting... f516a9e 20 days ago 3 commits

.idea	first mobile commit	26 days ago
app	feature1-remove dev settings and enable multiple records	20 days ago
gradle/wrapper	first mobile commit	26 days ago
.gitignore	first mobile commit	26 days ago
build.gradle	first mobile commit	26 days ago
gradle.properties	first mobile commit	26 days ago
gradlew	first mobile commit	26 days ago
gradlew.bat	first mobile commit	26 days ago
settings.gradle	first mobile commit	26 days ago

About No description, website, or topics provided.

Releases No releases published Create a new release

Packages No packages published Publish your first package

Languages Java 100.0%

Appendix D - To allow the emulator to connect to the back office the user needs to run the following command

```
C:\Users\jmccann.IT1708L\AppData\Local\Android\Sdk\emulator>emulator.exe -avd Nexus_4_API_30 -dns-server 8.8.8.8
emulator: Android emulator version 30.5.4.0 (build_id 7243153) (CL:N/A)
```

Appendix E - Link to Server URL

<http://10.0.2.2:8000>