Report

The development of this mobile application on behalf of the National Public Health Organization was made possible thanks to Android Studio which is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development.

(https://developer.android.com/studio)

The technical aspects that have been selected for the development of the application are :

- Empty Activity has been chosen as the first step.
- Programming language : Java
- Minimum SDK : API 30:ANDROID 11.0(R)
- Virtual device (for testing the application) : Pixel XL API 30
- Data management : Firebase Realtime Database for the functionality of vaccinations' appointments which is a cloud-hosted database.

The integration of videos with instructions of what we should be careful about the pandemic is a result of using the library android-youtube-player.

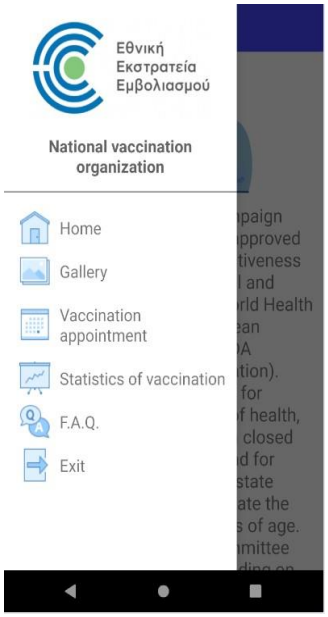
(https://github.com/PierfrancescoSoffritti/android-youtube-player)

In order to call the REST API from the official page (https://www.data.gov.gr/datasets/mdg_emvolio/) for the covid-19 vaccination statistics, the Retrofit library has been used.

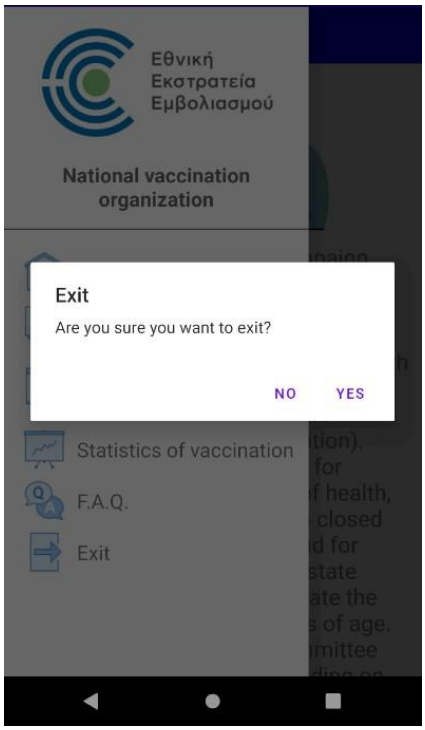
(https://square.github.io/retrofit/)

And finally, to improve the appearance of the application, various ready-made icons were used on the navigation bar.

(https://icons8.com/icons/ultraviolet):



As we can see, there are 5 main activities in which user can navigate and at the bottom we can see the option “Exit” in which user will be prompted to exit or stay in the application:



If the option “NO” is chosen, user will stay in the application but if the option “YES” is chosen, user will exit the application.

Moving on, the main activity which is called “Home” in the navigation panel looks like this:

It contains general information of the organization and an image. At this point, the opportunity is given to say that the application supports both Greek and English and the application chooses the preferred language automatically by the language of the device in which it is running.

In the above image, “Home” activity is in English, but if the language of the device is changed to Greek within the settings of the system, then the Home activity is translated to Greek:

All the activities of the application are supported in both languages. Within Android Studio IDE, selecting file strings.xml with right click and choosing option Open Translations Editor, the Greek language was added, and the corresponding file was created:

All the modifications were made in the Translation Editor adding the key with its default value in English and its translation in Greek:

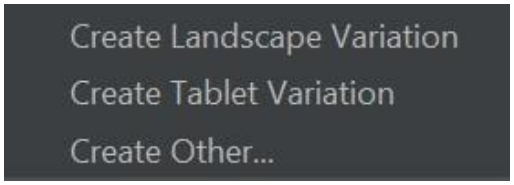
Key	Resource Folder	Untranslatable	Default Value	Greek (el) in Greece (GR)
app_name	app/src/main/res	☐	Mobile_App	Mobile_App
nav_header_title	app/src/main/res	☐	National vaccination organization	Εθνικός οργανισμός εμβολιασμού
nav_header_subtitle	app/src/main/res	☐	COVID-19 Vaccination	Εμβολιασμός COVID-19
menu_home	app/src/main/res	☐	Home	Αρχική
menu_gallery	app/src/main/res	☐	Gallery	Εικόνες και βίντεο
home_text	app/src/main/res	☐	The National Vaccination Campaign	Η Εθνική Εκστρατεία Εμβολιασμού
gallery_images	app/src/main/res	☐	Images	Εικόνες

It deserves to be noted that emphasis was given in improving the appearance of the application in the landscape mode which is when user turns the device horizontally.

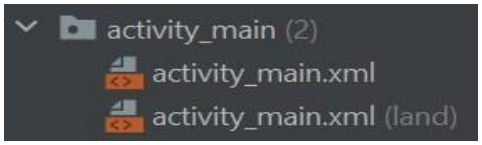
For example, in the main activity:

The image takes a bigger part of the screen from before.

In the xml file of the activity in the tab design, the option Create Landscape Variation has been chosen:



In which the corresponding file is created in landscape mode and there is the option to modify various characteristics only in landscape mode:



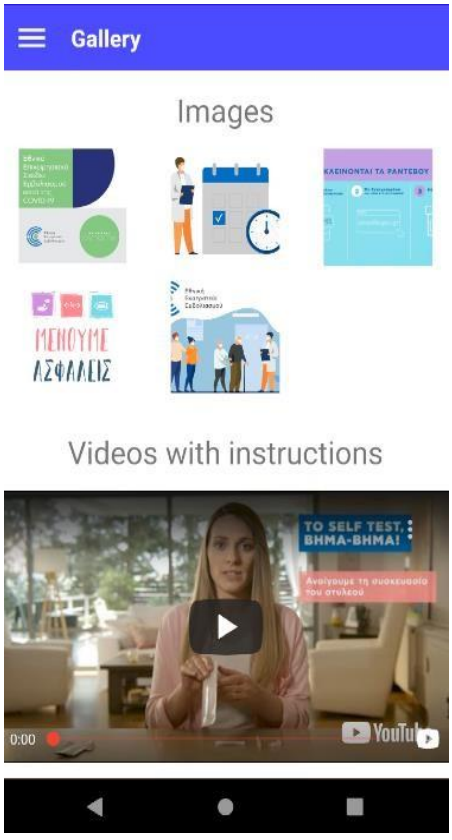
In the main activity, only the height of the image was modified. As we can see, in the portrait mode the height was 220dp:

```
<ImageView
    android:id="@+id/imageView1"
    android:layout_width="wrap_content"
    android:layout_height="220dp"
    android:src="@drawable/home_image" />
```

Meanwhile, in landscape mode the height of the image is 340dp:

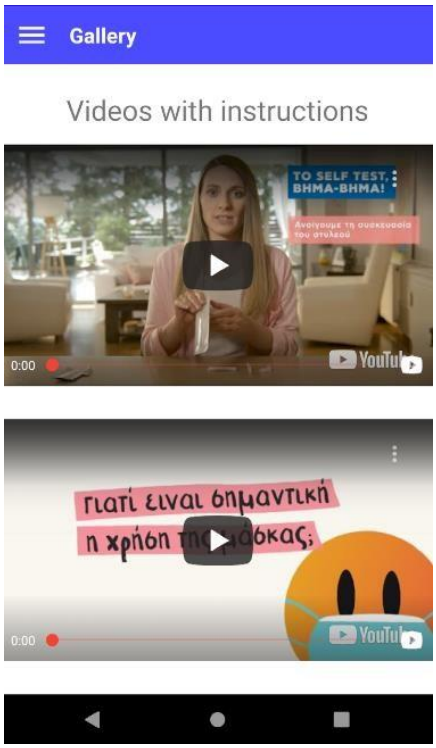
```
<ImageView
    android:id="@+id/imageView1"
    android:layout_width="wrap_content"
    android:layout_height="340dp"
    android:src="@drawable/home_image" />
```

In the next activity of the application, “Gallery” contains various images of the organization in grid layout:



And if the user taps on an image, the image will be viewed in Fullscreen mode:

Additionally, in this activity there are videos with instructions of what we should be careful about in the pandemic:



As it was mentioned in the beginning, the library “android-youtubeplayer” was used for integrating the videos. The only thing that was needed in order that to happen was a declaration of the library in the gradle file:

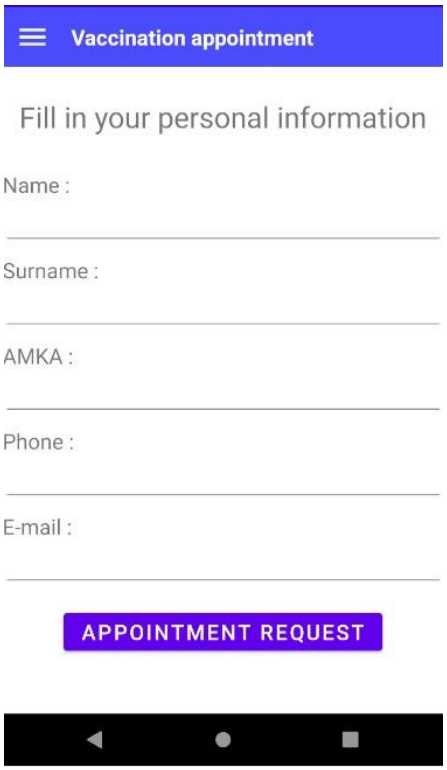
```
implementation 'com.pierfrancescosoffritti.androidyoutubeplayer:core:10.0.5'
```

And in the xml file, the integration of the videos is made right on the spot:

```
<com.pierfrancescosoffritti.androidyoutubeplayer.core.player.views.YouTubePlayerView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    app:videoId="uqy9EtE1uuE"
    android:layout_marginBottom="16dp"
    app:autoPlay="false"
    app:showFullScreenButton="false"/>
```

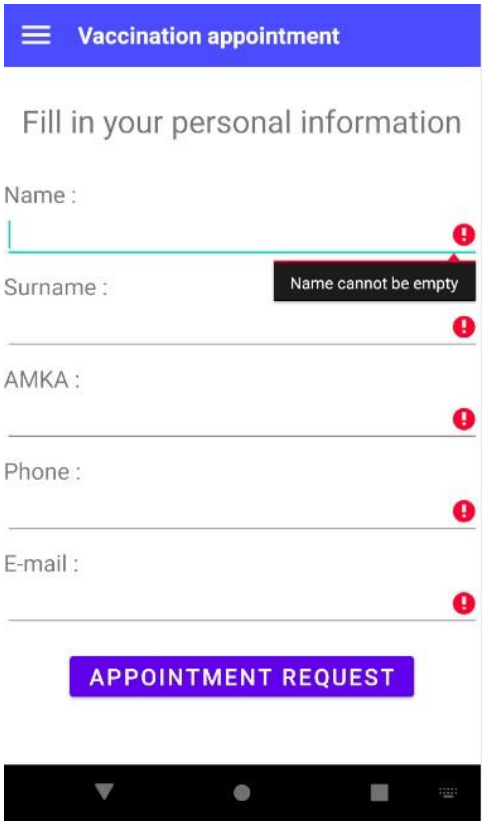
In the next activity which is called the “Vaccination appointment”, the user can enter personal information and then the application will arrange an appointment in a random date and time. The personal details of the user are stored in the data base Firebase Realtime DB and remain saved in the application with the use of shared preferences in which even if the user exits the application the data is still saved in the application.

These personal details are asked:



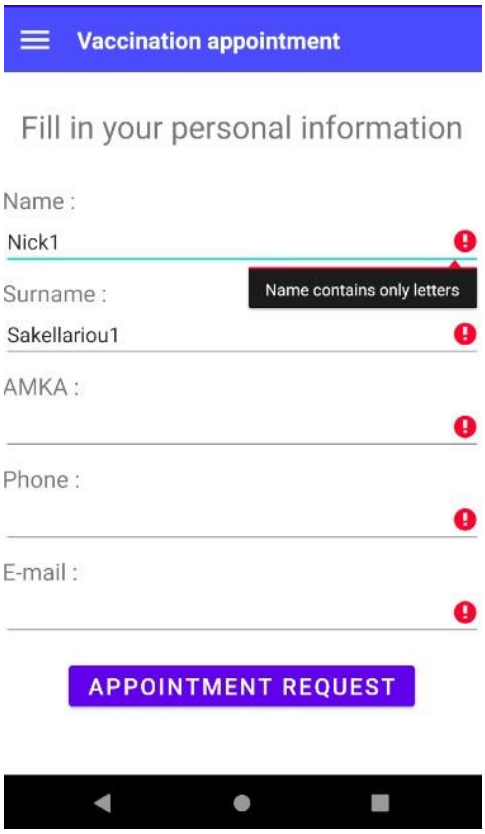
In which there are restrictions in what the user can enter.

All the fields are mandatory:

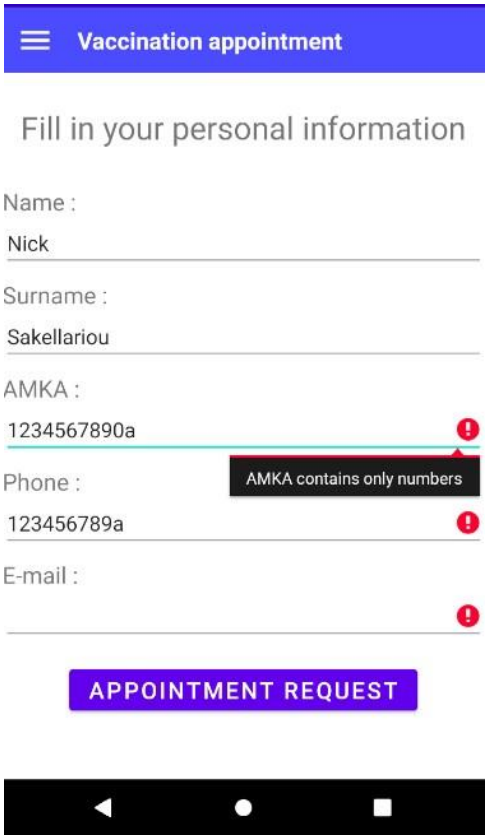


If the user presses the button “APPOINTMENT REQUEST” without entering information in every field, an error message will be shown.

Fields name and surname can be entered using only Greek and Latin characters and not numbers:



Fields AMKA and phone can be entered using exactly 11 and 10 numbers correspondingly:

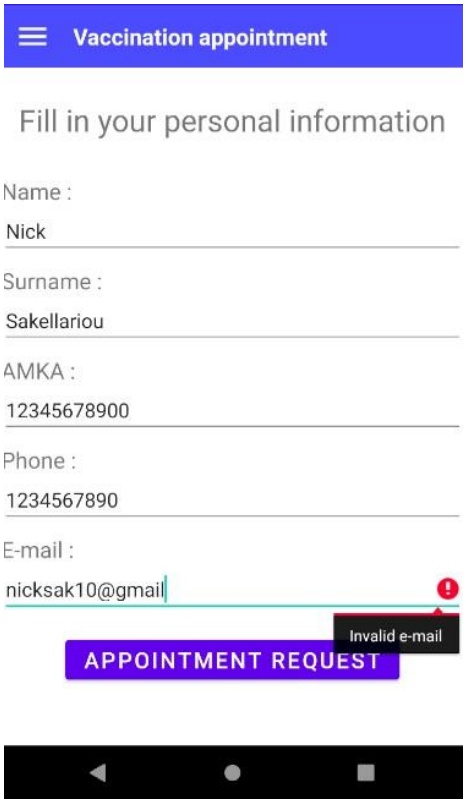


And in the end, the field of email can be entered correctly using only this combination of characters:

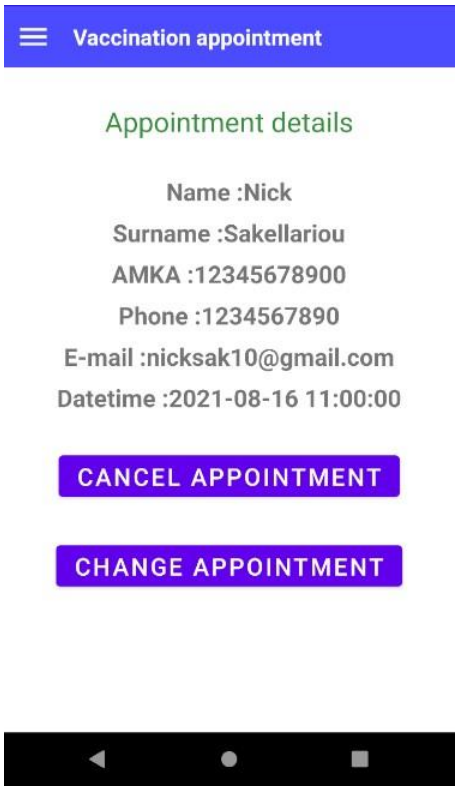
```
private boolean validateEmail() {
    String email = editText_email.getText().toString().trim();
    String checkmail = "[a-zA-Z0-9._-]+@[a-z]+\\.+[a-z]+";

    if (email.isEmpty()) {
        editText_email.setError("E-mail cannot be empty");
        return false;
    } else if (!email.matches(checkmail)) {
        editText_email.setError("Invalid e-mail");
        return false;
    } else {
        editText_email.setError(null);
        return true;
    }
}
```

If the user enters something that does not look like the above combination of characters, an error will be shown:

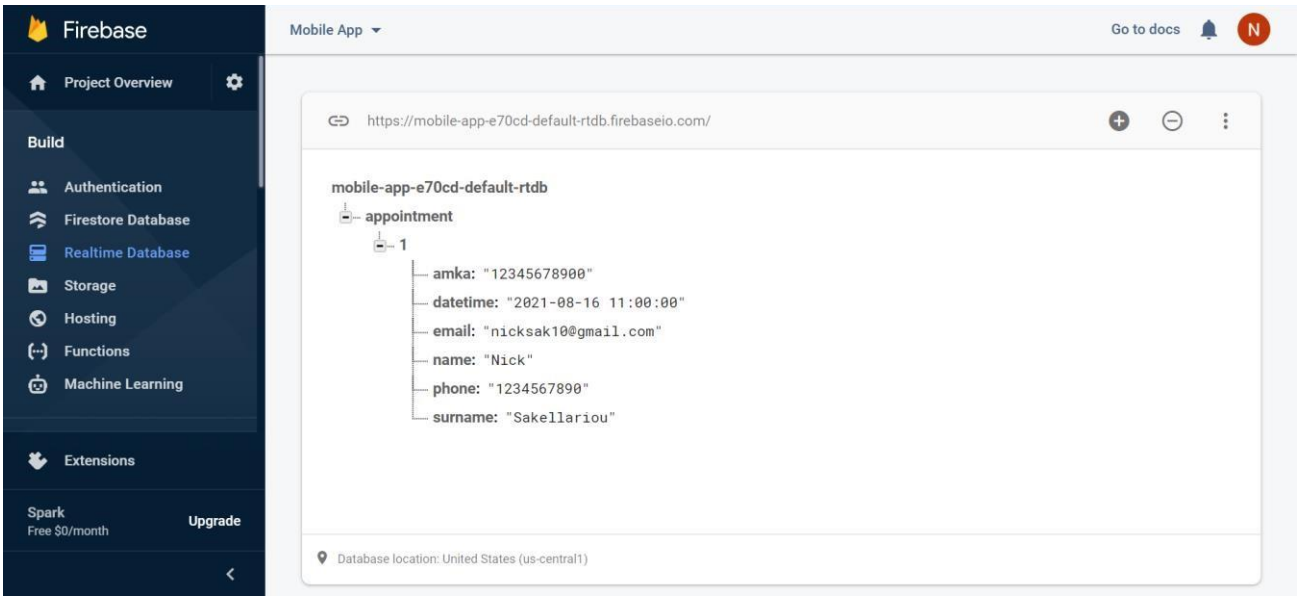


If the user enters successfully all of his personal information, a toast message will be shown: “Your appointment has been arranged” and then can proceed in the next activity in which all the details of the appointment can be seen:



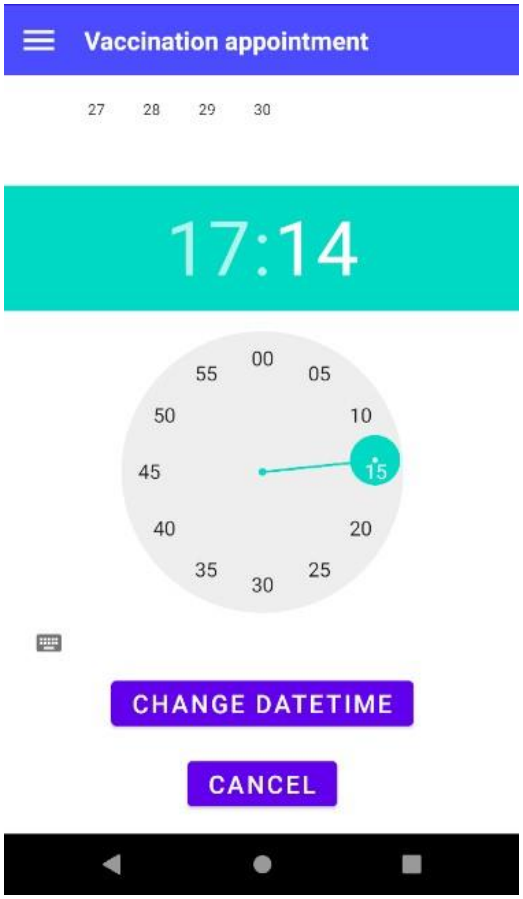
As the options to cancel or change the appointment.

All the personal details are stored in the data base:

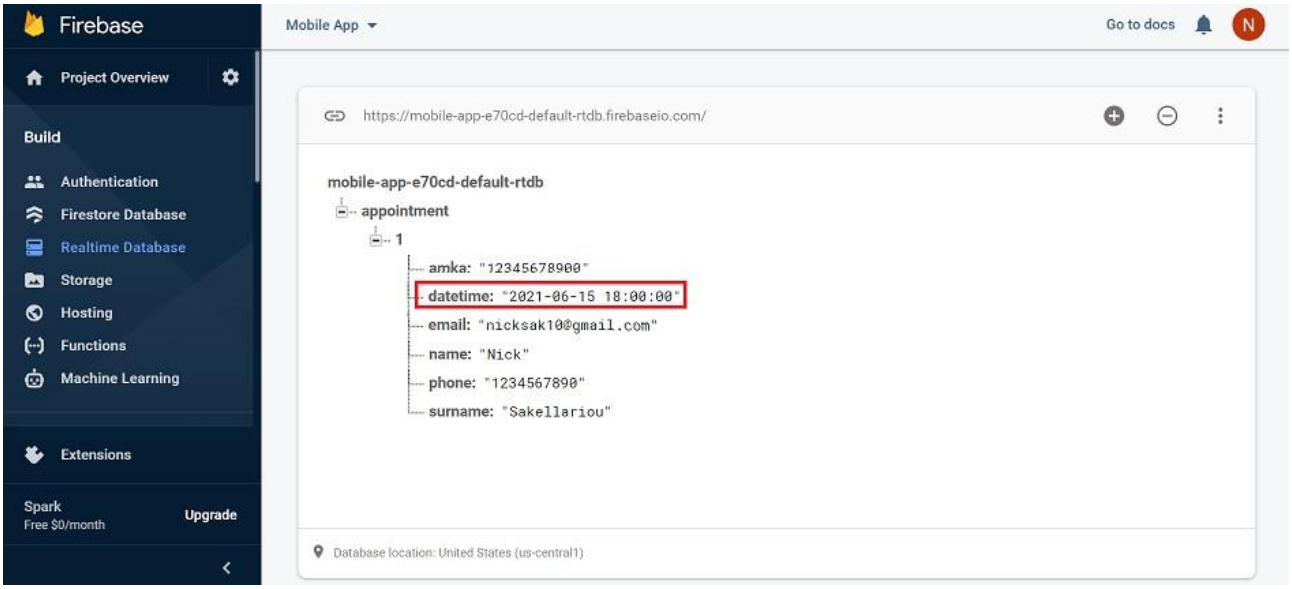


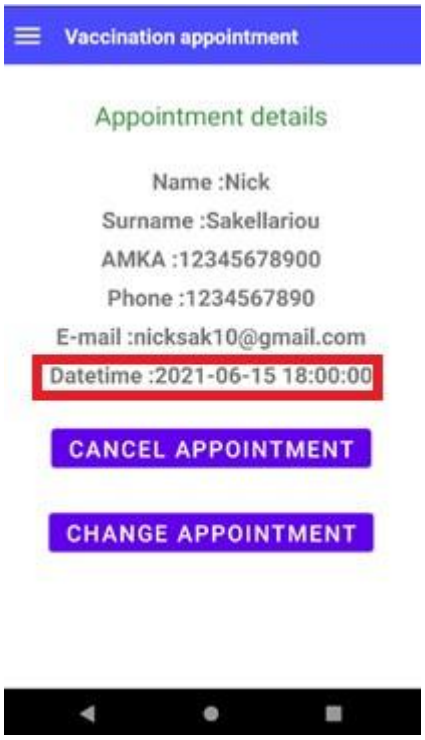
And these details remain saved in the application, so if the user exits the application, the appointment will still be saved and can be viewed later. If the user presses the button “CANCEL APPOINTMENT”, the appointment will be deleted from the database and the application, and the user will be transferred to the activity in which the personal information can be entered. But if the user presses the button “CHANGE APPOINTMENT”, then the user will be transferred to the activity in which the date and time of the appointment can be changed:

And pressing the button “CHANGE DATETIME”:

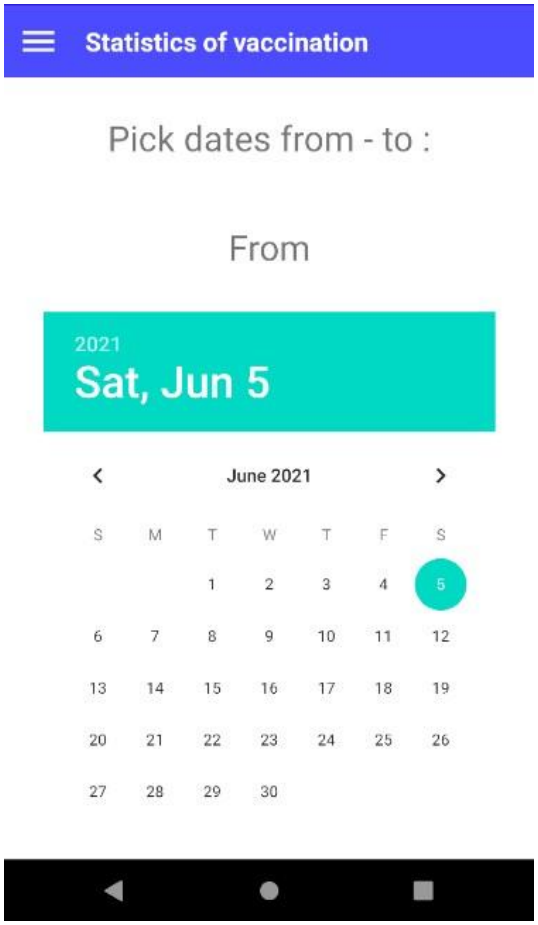


After having chosen the preferred date, the date of the appointment will be modified in the database and the application. For example, if the date of the appointment is 15-06-2021 and the time is 18:00, we will be able to see the changes:

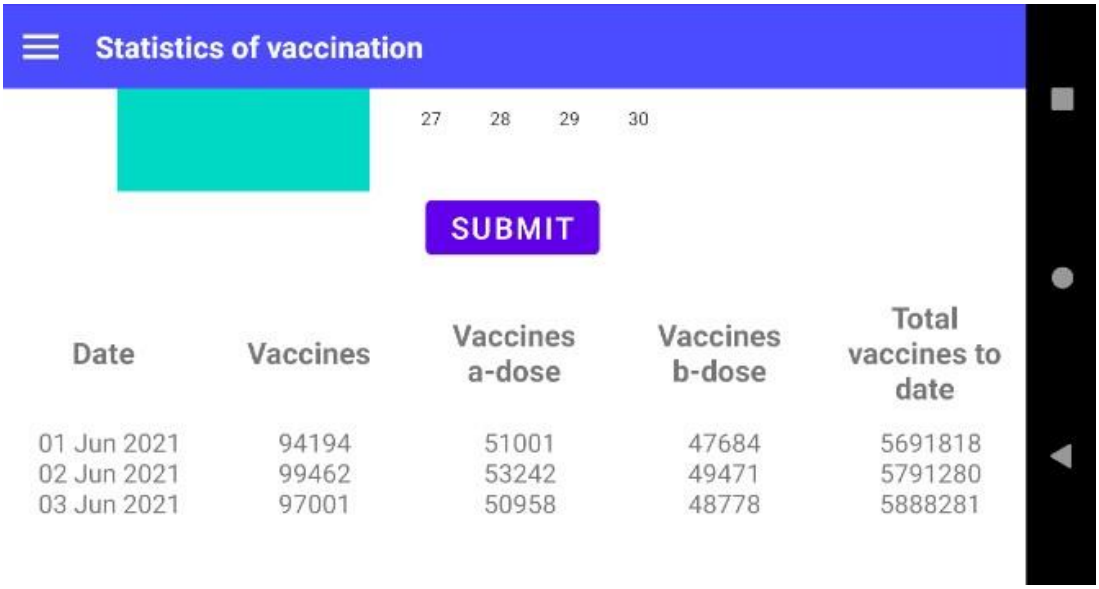




Moving on, in the next activity which is called “statistics of vaccination” user can choose date “from”, date “to” and in a table the results of all the vaccinations of covid-19 in Greece for each day for the preferred period will be shown:



So, if the user chooses for example “01-06-2021” and “03-06-2021” and presses the button “submit”, the results will be shown in the following table:



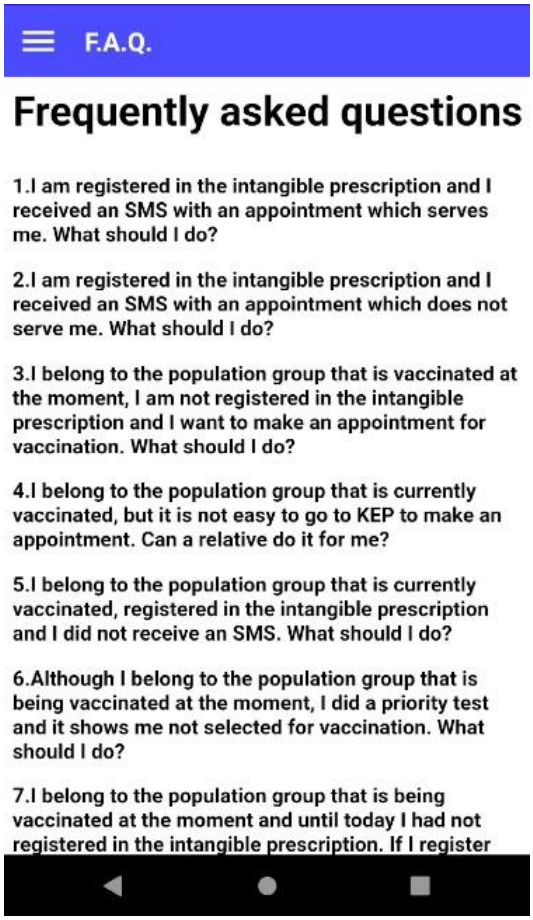
The above image is in landscape mode for the whole table to show up, as in portrait mode horizontal scrollview has been added and the user must drag the device’s screen to see the whole table.

As mentioned in the beginning, the library Retrofit has been used in order the REST API to be called:

```
Retrofit retrofit = new Retrofit.Builder()
        .baseUrl("https://data.gov.gr/api/v1/query/")
        .addConverterFactory(GsonConverterFactory.create())
        .build();
```

And in the end, the last activity of the application is “F.A.Q.” in which user can navigate in a list of frequently asked questions and answers to them.

WebView has been used which helped the content of the activity to be created as HTML:


F.A.Q.
Frequently asked questions
1.I am registered in the intangible prescription and I received an SMS with an appointment which serves me. What should I do?
2.I am registered in the intangible prescription and I received an SMS with an appointment which does not serve me. What should I do?
3.I belong to the population group that is vaccinated at the moment, I am not registered in the intangible prescription and I want to make an appointment for vaccination. What should I do?
4.I belong to the population group that is currently vaccinated, but it is not easy to go to KEP to make an appointment. Can a relative do it for me?
5.I belong to the population group that is currently vaccinated, registered in the intangible prescription and I did not receive an SMS. What should I do?
6.Although I belong to the population group that is being vaccinated at the moment, I did a priority test and it shows me not selected for vaccination. What should I do?
7.I belong to the population group that is being vaccinated at the moment and until today I had not registered in the intangible prescription. If I register