Escuela de Ingeniería Informática

IUT département informatique MAUBEUGE

INTERNSHIP REPORT

Mobile development – Ovis application

Wafi GRISSI

School of computer science engineering

Oviedo - Spain

2017 - 2018

Summary

Thanks

At first, I would like to thank the IUT of Valenciennes which allowed me to do this internship and especially to Mrs. OLIVIERA and Mrs. GUEUDET who made it possible.

I would like to thank too Mr. Fernando Alvarez Garcia and Mr. Daniel Fernandez Lanvin and Mr. Luis Vinuesa, my supervisors.

I would like to thank Mr. Philippe POLET for following me up.

I would like to thank Nord-Pas-De-Calais region for the financial help to do this internship.

Finally, I would like to thank all members of the engineering school for their reception during these three months.

Abstract

My internship took place in the school of computer science engineering of Oviedo. I chose this offer because I want to improve my skills as a developer. I want to do a bachelor degree in development then a Master in Mobile development. This is why this school represented for me the best way to learn and apply theoretical knowledge I have learnt during my DUT at the IUT of Valenciennes. An institution that seeks to revolutionise its approaches.

The aim of my internship is to create a mobile application that will allow to the school's students to display their own timetable, get a follow-up on their courses and synchronize the timetable with a calendar app.

A prestigious computing engineering school, founded in 1982, that provides an integral formation in Computer Science, including all levels designed by the European Space of Higher Education (ESHE): graduate, master and doctorate.

My missions were to find a solution for timetable management problems based on the new technologies, namely mobile development.

To that end, I did go through three parts. The first one is to familiarize with the school operating to understand the methodology. The second part is to have a better approach of mobile and web development to know the different possibilities to solve the problems. The third one is to match between the two previous parts with its aims and constraints.

I had the chance to visit Oviedo and learn more about the Spanish culture.

Résumé

Dans le cadre de ma deuxième année en DUT Informatique, j'ai souhaité effectuer mon stage de validation des acquis théoriques à l'étranger ; L'opportunité de travailler au sein de l'école d'ingénieur d'Oviedo me fut proposée.

Ayant pour objectif de travailler à terme dans le développement, le sujet de stage était donc compatible avec mon projet professionnel.

L'objectif de mon stage est de créer un espace numérique pour les étudiants afin d'avoir un accès en temps réel à leur emploi du temps, à différentes annonces du secrétariat.

L'école souhaite donc fournir un accès mobile aux données des étudiants (emploi du temps), mais aussi à des annonces telles qu'un changement au niveau des emploi du temps, la planification des examens.

Etant spécialisée dans l'Informatique, l'école veut adapter, révolutionner son accès à l'information et mais aussi son encadrement.

Mes missions consistaient donc à trouver une solution à la problématique qui sera non seulement tirée du cœur de la révolution technologique, en l'occurrence le développement mobile, mais aussi adaptée au domaine académique de l'école et ses activités.

Pour ce, il fallait englober différentes tâches qui se résumaient à connaître l'école, ses activités et son fonctionnement afin de comprendre leur méthodologie et le contexte du projet ; Cela étant la première partie, elle sera suivie d'une deuxième qui nécessite une approche approfondie du développement mobile pour étudier les différentes solutions possibles. Pour finir, la troisième partie consiste à relier les deux premières, en fixant une implémentation, des objectifs et contraintes.

Introduction

By 2020, 70% of the world's population will own a smartphone ; A very strong figure revealed on the site of Android, and that speaks a lot about the future changes, whether in the technological or industrial field.

Mobile development is therefore very promising ; Providing flexible and revolutionary solutions.

School introduction

Since its foundation in 1982, the School of Computing Engineering of the University of Oviedo has been a national reference in training professionals in computer science.

@ **E-mail:** eii@uniovi.es

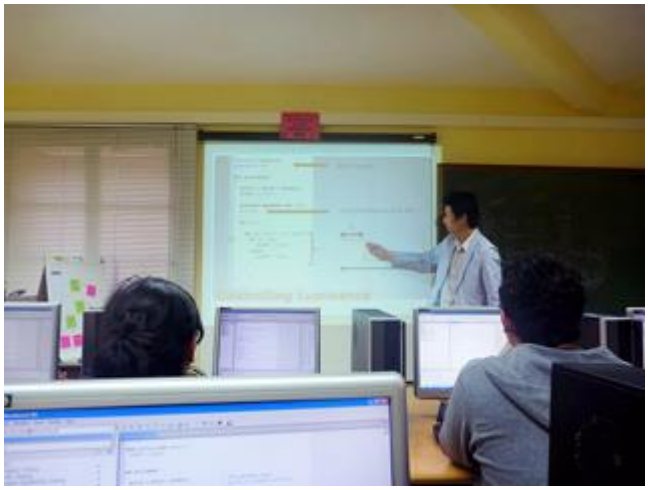
Address: Valdés Salas s/n. 33007 - Oviedo

Telephone: 985 10 95 49

Location

The School of Computing Engineering is located in Oviedo, capital city of thePrincipality of Asturias, an important financial, industrial and technological centre of the North of Spain.
Oviedo is a safe and beautiful city, being the administrative and political centre of the whole region. The city is communicated by plane with the main European and national capital cities : Madrid is just an hour away; Paris, London, Brussels and Barcelona are about hour and a half away while Zurich is only 2 hours from Oviedo.

Specialists on Computer Science

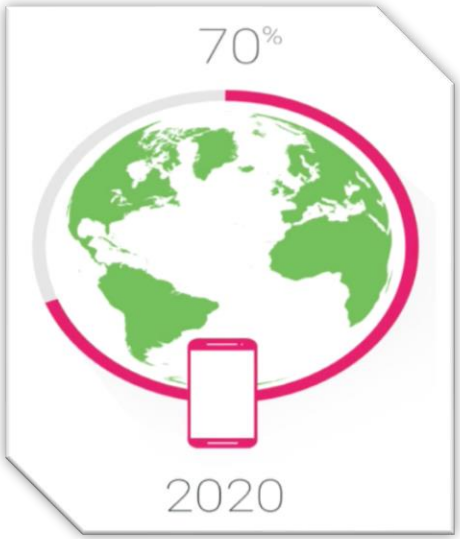


The centre provides an integral formation in Computer Science, including all the levels designed by the European Space of Higher Education (ESHE) : graduate, master and doctorate.

Its facilities are specially designed to teach Computer Science :

- 16 laboratories with over 400 computers.
- 6 classrooms with 691 seats.
- 2 all-purpose rooms that can be used as:
    - Usability laboratories.
    - 3D filming studios.
    - Audiovisual recording and editing labs.
    - Brainstorming.
- Electronics laboratory.
- Wi-Fi Internet connection in all the areas of the building.
- Virtual machines that host an individual virtual server for every student of master courses.
- Auditorium with 112 seats.

Project summary



At the beginning, I had to choose between Web programming (Ionic) and Mobile programming (Android/iOS). My supervisors and I, opted for Mobile development ; On Android.

The subject of the mission is to create an application that gives the students of the school access to their own timetable with a follow-up.

This application allows the user to connect via his ID of University ; Can also store it for an autocomplete next time he tries to log in.

Once connected, the student can display his timetable, get notifications about next courses and the possibility to synchronize the timetable (csv format) with a calendar app.

The problematic

As a student, direct access to the timetable is important ; To be informed of classes planning, and possibly any changes.

Therefore, this raises several questions on different fields; Especially in the choice of technology. Different technologies solve this problem, but in different ways. It is therefore essential to choose the solution that best meets our defined criteria. Criteria are based, among others, on cost, accessibility, relevance.

The technology

The possibilities

Ionic :

Ionic is a complete open-source SDK for hybrid mobile app development. Th e original version was released in 2013 and built on top of AngularJS and Apache Cordova. The more recent releases, known as Ionic 3 or simply "Ionic", are built on Angular. Ionic provides tools and services for developing hybrid mobile apps using Web technologies like CSS, HTML5, and Sass. Apps can be built with these Web technologies and then distributed through native app stores to be installed on devices by leveraging Cordova. Ionic was created by Max Lynch, Ben Sperry, and Adam Bradley of Drifty Co. in 2013.

Android :

Android is a mobile operating system developed by Google, based on a modified version of the Linux kernel and other open source software and designed primarily for touchscreen mobile devices such as smartphones and tablets. Android is also associated with a suite of proprietary software developed by Google, including core apps for services such as Gmail and Google Search, as well as the application store and digital distribution platform Google Play, and associated development platform.

iOS :

iOS (formerly iPhone OS) is a mobile operating system created and developed by Apple Inc. exclusively for its hardware. It is the operating system that presently powers many of the company's mobile devices, including the iPhone, iPad, and iPod Touch. The iOS SDK (Software Development Kit) allows for the development of mobile apps on iOS. Combined with Xcode, the iOS SDK helps developers write iOS apps using officially supported programming languages, including Swift and Objective-C.[130] Other companies have also created tools that allow for the development of native iOS apps using their respective programming languages.

The choice

Tests

I read different documentations, tutorials of the frameworks ; To select the proper solution.

```
8       <link href="lib/ionic/css/ionic.css" rel="stylesheet">
9       <link href="css/style.css" rel="stylesheet">
10      <script src="lib/ionic/js/ionic.bundle.js"></script>
11      <script src="cordova.js"></script>
12      <script src="js/app.js"></script>
13    </head>
14    <body ng-app="App">
15      <ion
16
17
18    </body
19  </html>
20
```

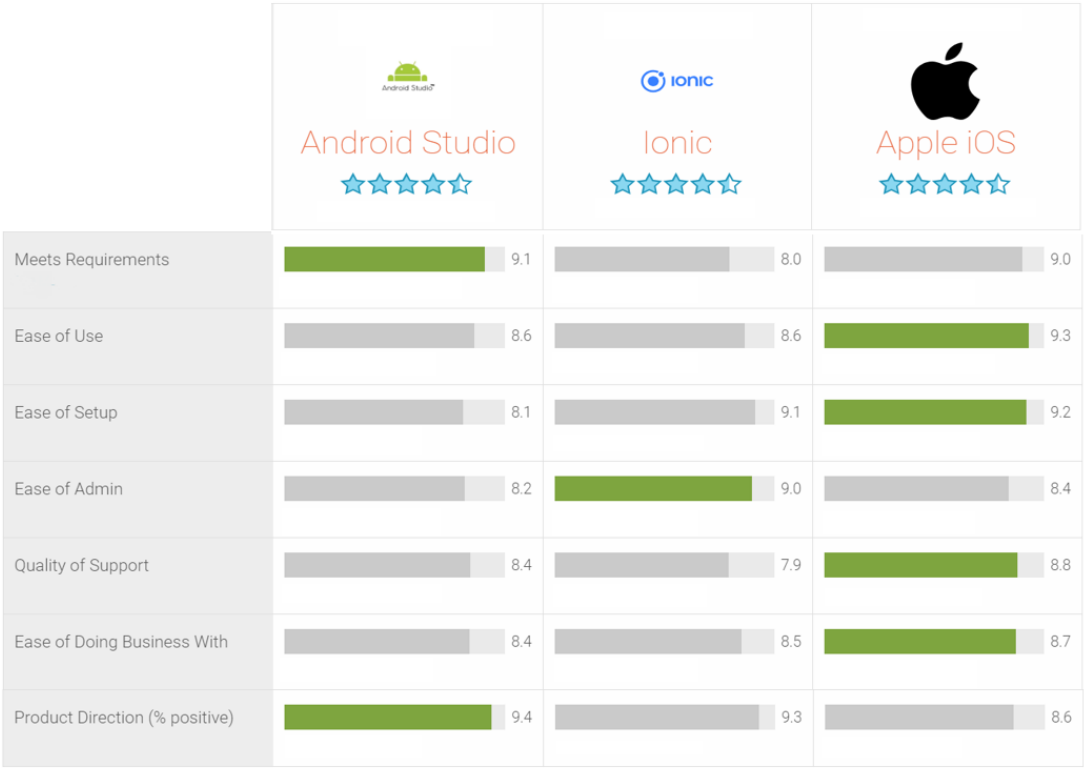
ion-checkbox
ion-content
ion-delete-button
ion-footer-bar
ion-header-bar
ion-infinite-scroll
ion-item
ion-list

IONIC - CODE EXAMPLE

ANDROID – CODE EXAMPLE

Selection

After studying the different possibilities, my tutors and I decided to choose android.
Following is a table comparing the different possibilities :



Planning

The internship is devided in 3 major parts :

« School » part :

In this part, I got to know the school and its planning system. It represents 10% of the internship period.

« Conception » part :

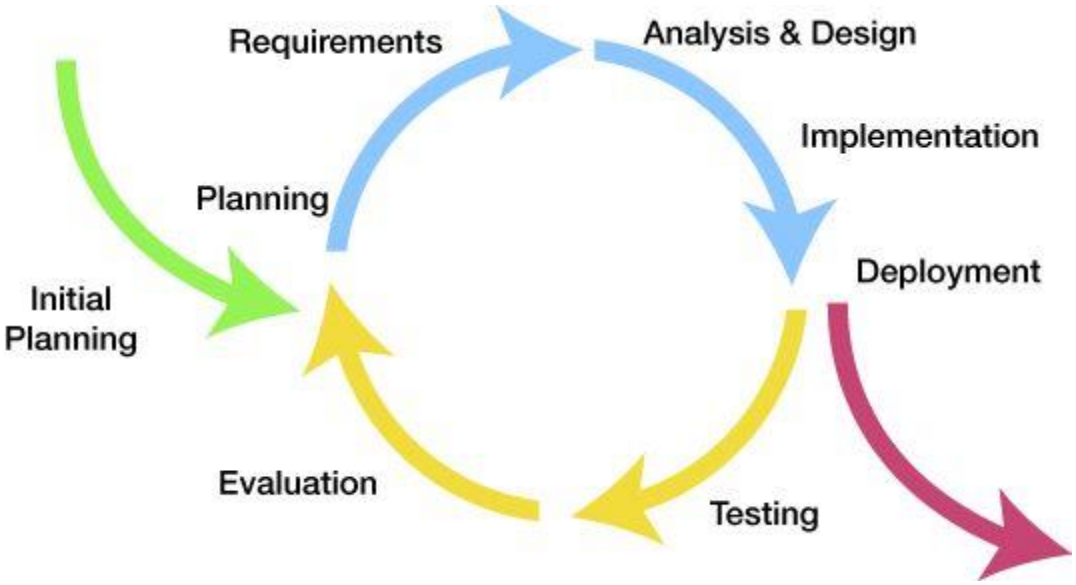
In this part I got to design the application. It represents 45% of the internship period.

« Development » part :

In this part I got to develop the application. It represents 45% of the internship period.

Cycle

I followed an iterative and incremental cycle as the needs were updated periodically. So the second and third parts were sequentially repeated. Every Wednesday, a meeting was held to check the progress of the project, specify and modify the needs.



Means

In this project, several means were employed.

Hardware :

- Computer
- Printer
- Mobile phone

Software :

- IDE (Android/Ionic)
- Planners (Trello)
- Versioning platform (GitHub)
- Design platform (Modelio)
- Text editors (MS Office/Brackets)

Documentation :

- APIs
- Tutorials

Cost

All the means used are freely accessible, so the project knows no monetary cost.

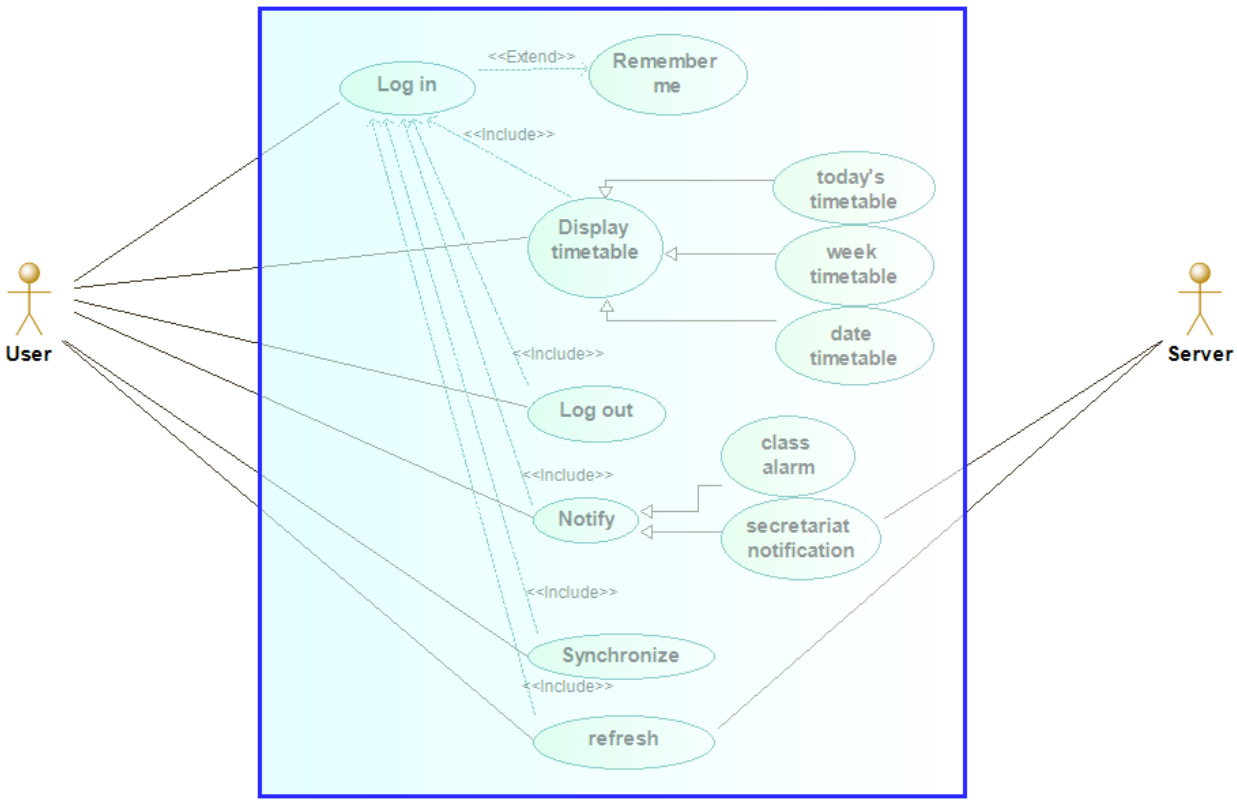
Conception

Requirements

Functions :

The application has several functions :

- Log in
- Remember me
- Display timetable
  - Today's timetable
  - Week timetable
  - Specific date timetable
- Log out
- Notification
  - Classes alarms
  - Secretariat notications
- Refresh
  - On click refresh
  - Automatic refresh
- Synchronization



Textual description

Title : Log in
Abstract : This use case allows the user to connect to the application
Actors : User
Preconditions :

- Internet access

Nominal scenario :

1. The system checks the existence of an UO
2. The user types in his UO, checks « remember me » box and clicks on log in button
3. The system checks the Internet access
4. The system checks the existence of the UO
5. The system stores the UO in preferences then signs the user in

Alternate sequences :
A1. Existing UO
This sequence starts at point 2 of the nominal scenario :

2. The system checks the Internet access
3. The system signs the user in

A2. Wrong UO
This sequence starts at point 5 of the nominal scenario :

5. The system shows a toast notifying the user of the invalidity of the UO
6. The user types again his UO
7. The system checks the Internet access
8. The system checks the existence of the UO
9. The system signs the user in

Exceptional sequences :
E1. Unavailable network
This sequence starts at point 4 of the nominal scenario :

4. The system shows a toast notifying the user of the lack of connection

Title : Display timetable
Abstract : This use case allows the user to show his timetable
Actors : User
Preconditions :
- Internet access
- Logged in

Nominal scenario :
1. The user clicks on « myWeek » card
2. The system extracts data
3. The system displays the timetable in week view

Alternate sequences :
A1. Different view
This sequence starts at point 4 of the nominal scenario :
4. The user choses day or 3 days view
5. The system displays the timetable in the proper selected view

Exceptional sequences :
E1. Missing data
This sequence starts at point 3 of the nominal scenario :
3. The system shows a toast notifying the user of the data lack

Title : Log out
Abstract : This use case allows the user to sign out from the application
Actors : User
Preconditions :
- Logged in

Nominal scenario :
1. The user clicks on « Log out » card
2. The system displays a popup to ask for user confirmation
3. The user confirms the log out query
4. The system deletes the UO and signs out the user

Alternative sequences :
A1. Cancel
This sequence starts at point 3 of the nominal scenario :
3. The user cancels the log out query
4. The system dismisses the popup

Title : Class alarms
Abstracts : This use case allows the user to schedule alarms to corresponding classes
Actors : User
Preconditions :

- Logged in

Nominal scenario :

1. The user clicks on « Class alarms » card
2. The system displays a popup to ask for user confirmation
3. The user confirms the query
4. The system creates alarms to the corresponding classes

Alternate scenario :
A1. Cancel
This sequence starts at point 3 of the nominal sequence :

3. The user cancels the query
4. The system dismisses the popup

Title : Refresh
Abstract : This use case allows user to refresh data
Actors : User
Preconditions :

- Internet access
- Logged in

Nominal scenario :

1. The user clicks on « Refresh » card
2. The system displays a popup to ask for user confirmation
3. The user confirms the query
4. The system checks the Internet access
5. The system refreshes the data

Alternate sequences
A1. Cancel
This sequence starts at point 3 of the nominal scenario :

3. The user cancels the query
4. The system dismisses the popup

Design :

Graphical charter

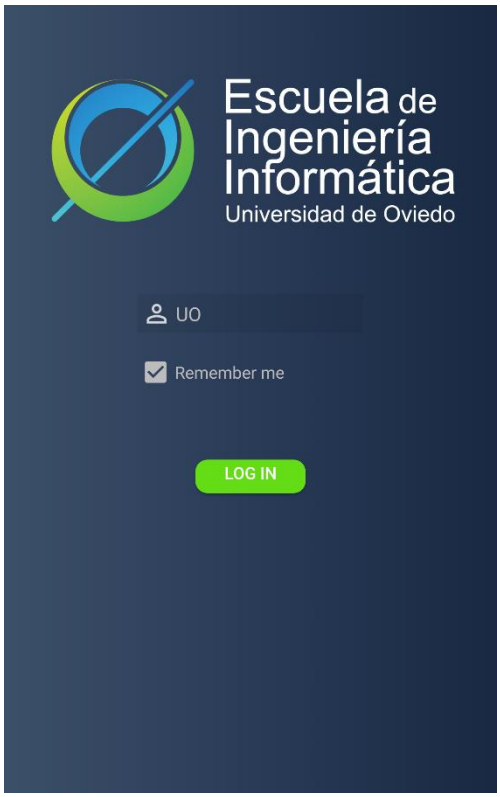
The application design is made to make the application intuitive ; With icons and color palette respecting the colors of the school.
The document entitled « Model » shows the sketch representing the design of the application.

Log in screen

The first time ever that the user starts the application, this screen appears.
We find :

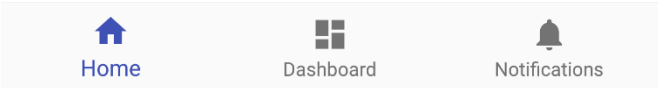
- School's logo
- Input text where the user can type his UO
- Checkbox to remember or not the UO (default : true)
- Button to log in to the application.

If the user checks the box, next time he starts the application, he will be directed to the home activity.



Navigation

The user have a navigation bar in the bottom of the home activity screen.

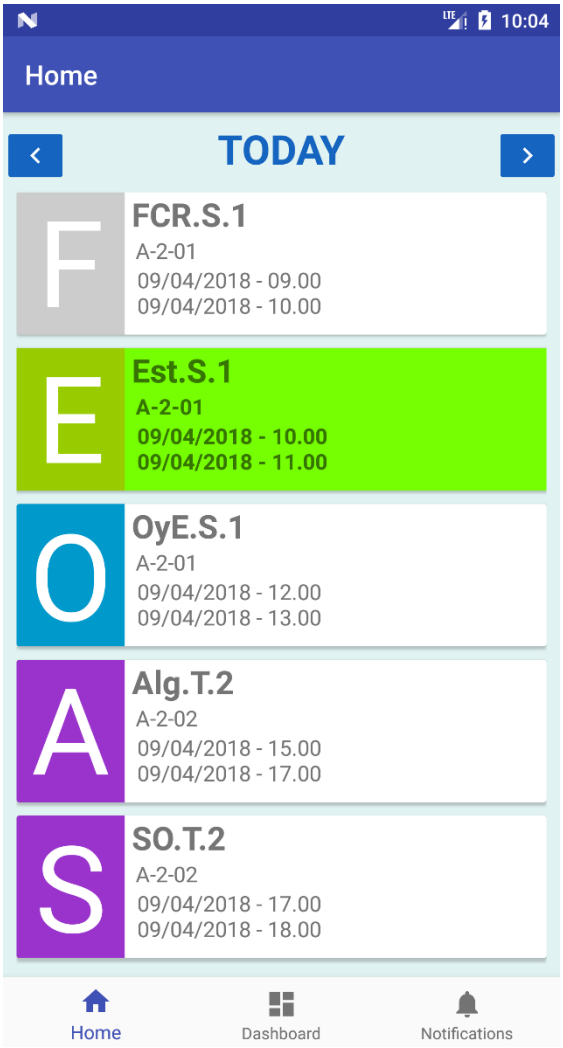


Home

Home is the default tab of the home activity. In this tab, the user can see his today's timetable.
And two buttons to nivagate through the days, and between the date.
Each class is represented in a square where we can find :

- First letter of the subject as an icon
- The subject
- Start date and time
- End date and time

Current class is colored in green.

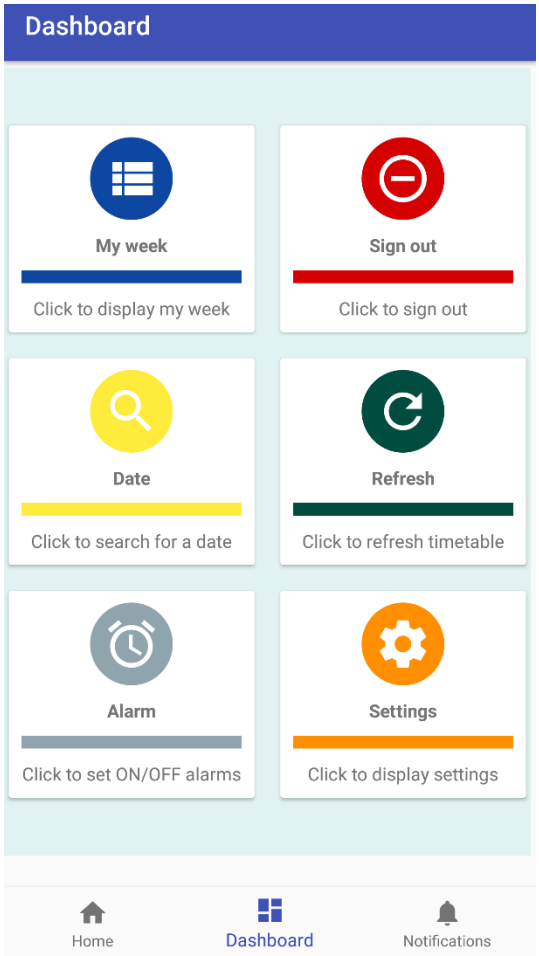


Dashboard

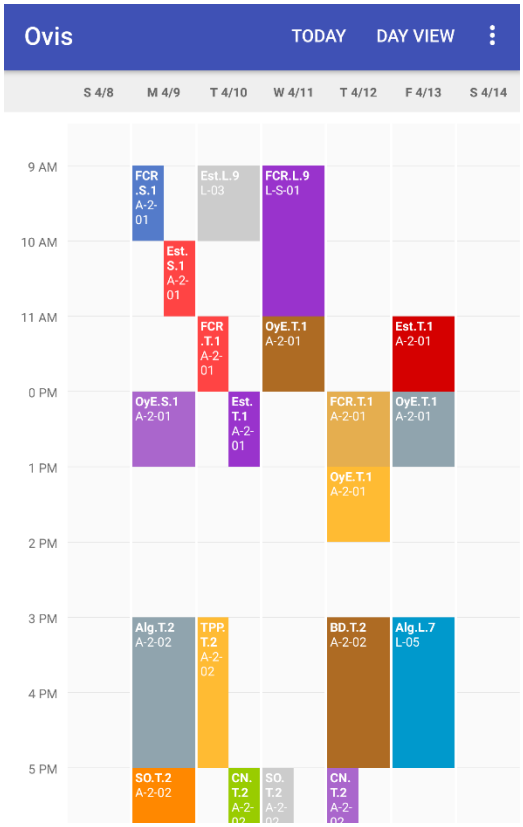
In this tab, the user have access to the different functions of the application.

Each feature is reprsented in a square where we find :

- Icon
- Name
- Description



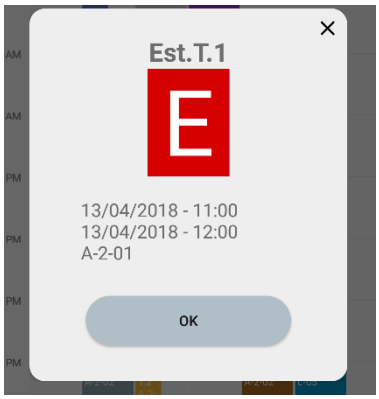
Timetable (Calendar view)



In this view, the user can see his timetable in :

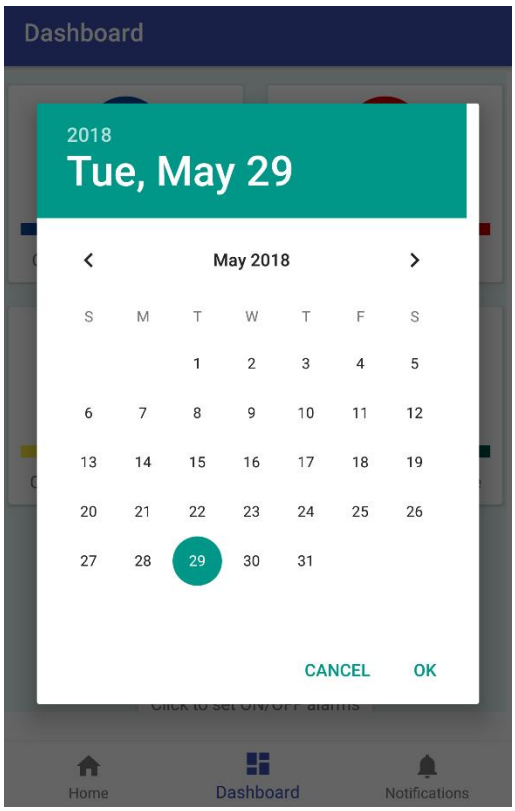
- Day view
- Three days view
- Week view

Each square represents a class. On click, a message dialog shows informations about the selected course :



Date picker :

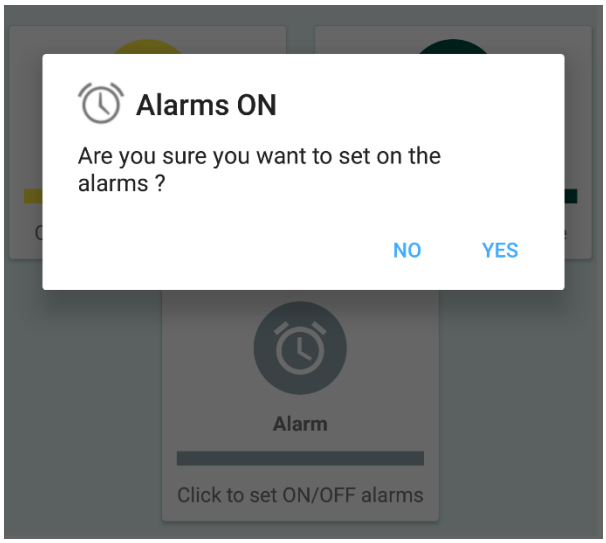
In this dialog, the application shows a calendar for the user ; To pick a specific date then show its timetable.

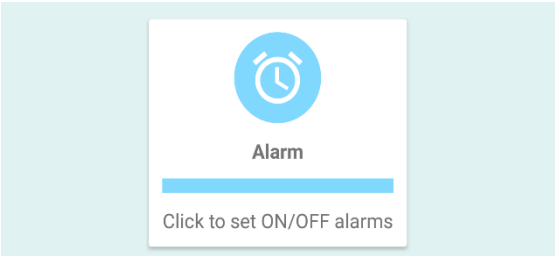


Classes alarm

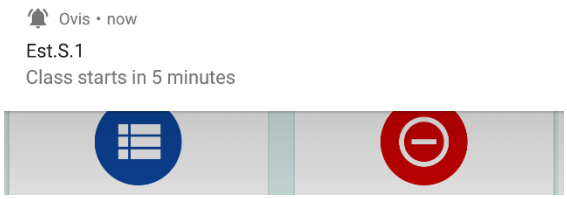
If the user enables the alarms, notifications will show five minutes before each class.

1- The alarm card is grey before the user sets the alarms on. Then becomes blue.





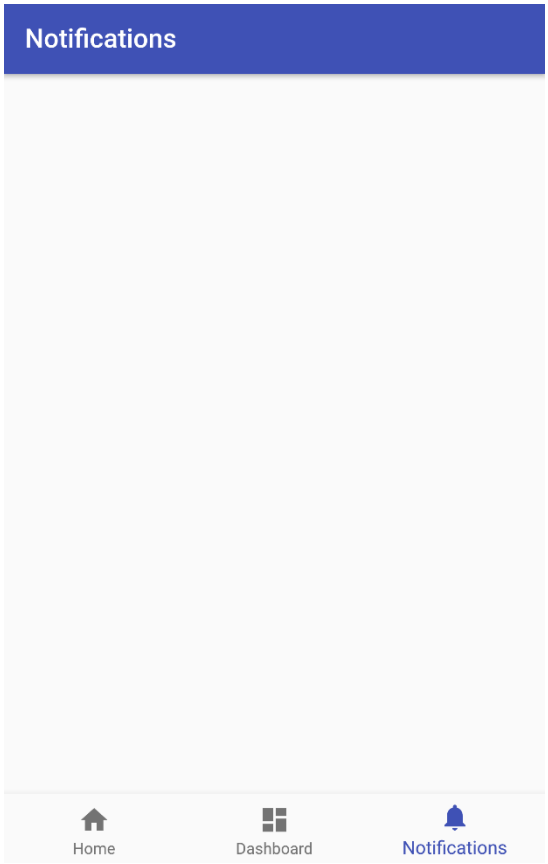
2- Once set on and a class in going to start, the user receives a notification with the module name as title.



Notifications

In this tab, have access to events recieved via notifications from secretariat.
Each event is represented in a square where we find :

- Logo
- Title
- Description



Development

Progress :

The file entitled « Progress » attached shows progress of functions' implementation.
Progress was checked every Wednesday.

Versioning :

I used GitHub for version control. I periodically recorded the progress by pushing the changes on this platform.

Features :