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Project Proposal - Mobile Application

Mobile Development - University of Genova - a.a 2023/24

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Overview

Our mobile application involves a dashboard that shows data sent by sensor in water jugs with filters. Those data are sent from sensors in the jugs, following guidelines explained, and with which we merge the project, by the Internet of Things (IoT) master course.

Sensor data

The sensor we use is a fluxometer (potentiometer).

The data we retrieve and show in the dashboard represent the following parameters:

- Total consumption of water
- Daily consumption
- Filter capacity
- Quantity of plastic saved (by using a jug)
- Quantity of filter usage saved / exhausted filters
- Filter time remaining
- Percentage of usage of filter

Functionalities and flows

This section will present the functionalities with the flows that contain them that are implemented in the application.

Main views

Registration and Login

Jugs app

The image displays two wireframe screens for the 'Jugs app'. The top screen, titled 'Register', has a yellow background and contains three input fields for 'Email', 'Password', and 'Confirm Password', followed by a 'Register' button. The bottom screen, titled 'Login', has a light blue background and contains two input fields for 'Email' and 'Password', followed by a 'Login' button.

Register

Email

Password

Confirm Password

Register

Login

Email

Password

Login

This will be the first page when the app opens (if not already logged), to continue in the app the user must provide their credentials. If an account has not been already created, the user is needed to create an account with the register box.

To make the application work, a WiFi connection is needed to connect to the remote server with the database that contains the login information.

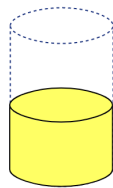
Dashboard



Dashboard - Kitchen Jug

Total consumption	Daily consumption
25L	2L
Filter capacity	Filter time remaining
150L	43h
Quantity of plastic saved	
2Kg	

80% filter usage



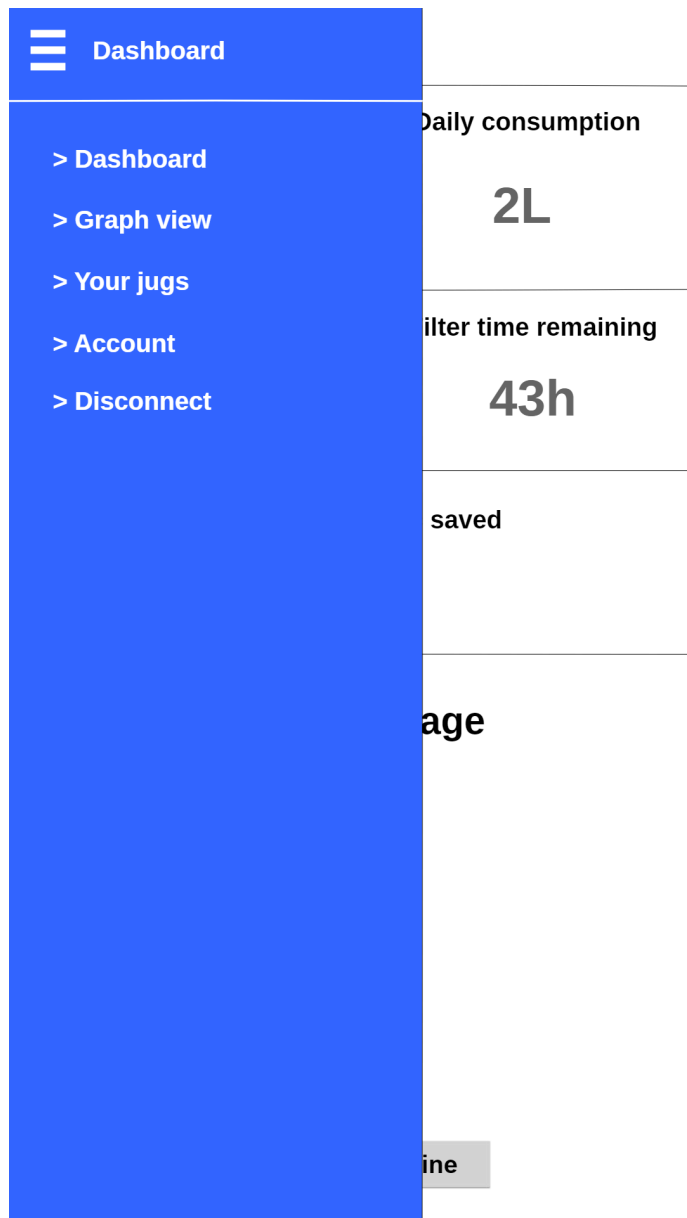
Buy a filter online

This page is provided as first if the user has already logged in and has a registered jug; otherwise the dashboard will show no values under each label. Moreover this page shows all the information sent by the jug sensors. The dashboard shows the data retrieved by the jug displayed on the top as follows: "Dashboard - <jug name>".

The dashboard shows also, in the bottom part, a percentage of the filter usage, with a cylinder as reference, colored with the amount of the filter capacity reached.


The user can also click on the bottom button to buy a filter.

Side menu / Bottom navigation bar

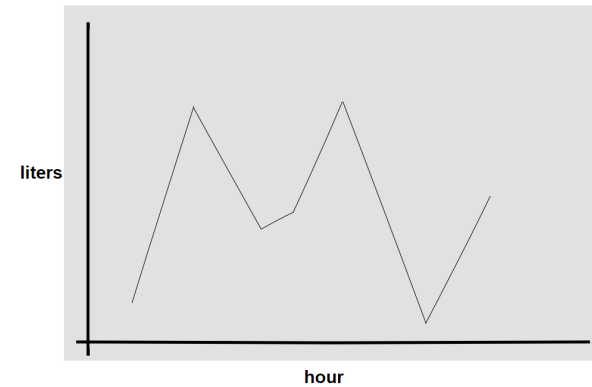


By clicking on the hamburger icon, the user can navigate through the app and see other sections from jugs information and account managing to disconnection.

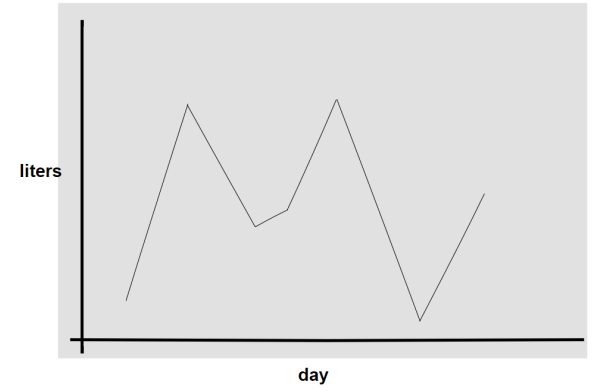
Graph view

 Graph

Liters consumed in the last hours



Liters consumed in the last days



This view shows two graphs about the water consumption respectively in the last hours on the current day and in the last days of the current month.

Account management



Account

Your account

Email

Change email

Change password

Disconnect

Delete account

In this page the user can review his email and by editing the field and clicking the “Change Email” button he can update their email. By clicking on the “Change password” button the user will be redirected to the “Change Password” page. By clicking the “Disconnect” button the user will be disconnected. By clicking the “Delete account” button the user will be disconnected, their credentials and their jugs information deleted.

Change password



Change password

Change password

In this page the user can edit the password fields to change their password. By clicking the “Change password” button the user will confirm the new password, if the old password is verified.

Jugs management



Jugs

Your jugs

Kitchen jug

Change filter

Rename

Livingroom jug

Change filter

Rename

Pair a new jug

In this page the user can review the owned jugs, rename them or pair new jugs via Bluetooth. By clicking on the name, the user will be redirected to the Dashboard, displaying the information about the selected jug.

Other functionalities details

Buy filter online

By clicking on the bottom button of the Dashboard view, the application will redirect to the browser to search for a new jug filter. Any action performed by the user from this point will not involve or influence in any way the application behavior.

Push notifications

When the filter usage reaches a percentage of filter usage near the 100%, the application will send a notification suggesting to buy a new filter. If the user clicks on the push notification, they will be redirected to a browser online to search for jug filters, similar to the “Buy filter online” section described before.

Disconnection

Any moment the disconnection term is cited, the application will redirect the user to the Register/Login page. No information of the user is deleted, so when the user logs in a second time, all the jug associations will be kept.

Technologies

The application needs the following technologies to work properly:

- WiFi, to pair, to retrieve sensor data, perform login, manage account information and to collect data for aggregated data analysis by vendors

We do not use any other sensor from the mobile device.

Privacy of the user

The jugs sensor data will be also sent via WiFi to the vendor server, in an aggregated way. The only user data that will be saved on the vendor servers are their credentials and their associations with their jugs in order to properly display the dashboard for each owned jug.

More technical details

The application will be implemented in Kotlin via Android Studio. The layout and design graphics will be implemented in Jetpack Compose.