FOODINTEGRITY

Ensuring the Integrity of the European food chain

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Dissemination level		
PU	Public	X
PP	Restricted to other participants	
RE	Restricted to a group specified by the consortium	
CO	Confidential, only members of the consortium	

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Deliverable 15.4 - F.I.S.HUB Application

Executive Summary

This Deliverable describes the structure of the FisHUB App that will allow users to use their mobile devices (IOS and Android) to take pictures of whole fish samples and submit them to the FisHUB classification server. The FISHUB App is just a mobile interface to the FisHUB database and classification server that were developed during the project. Therefore, this deliverable will not report classification testing results, that are available in the deliverable 21.2.

The FISHUB App allows, in this first release, to take or select a picture (from the phone photo album), to Select the corresponding species, send them to the FISHUB classification server, and finally to display the classification results.

The App also allows to browse the species covered by the FISHUB project and, for each of them, display a representative photo and its main morphological characteristics.

On the server side, the app stores all submitted images in order to create a pool of "crowd sourced" images that, after a careful review can be included in the FisHUB database in order to increase its size and, eventually, the classifier performances.

The FisHUB App will be available in the Apple and Google Play Stores before the end of the project. It is now in Beta Testing phase. It will not be released to the public till the performances of the classification server will be acceptable for all the considered species (see Deliverable 21.2). The Windows Phone version of the App will not be released due to the very low market share of this operating system.

Description of Deliverable

This deliverable shows the structure and the functionalities of the FisHUB App. The app implements two main functionalities:

1) The validation of a fish photo against a declared label (species)
2) A simplified browsing of the species included in the FisHUB database

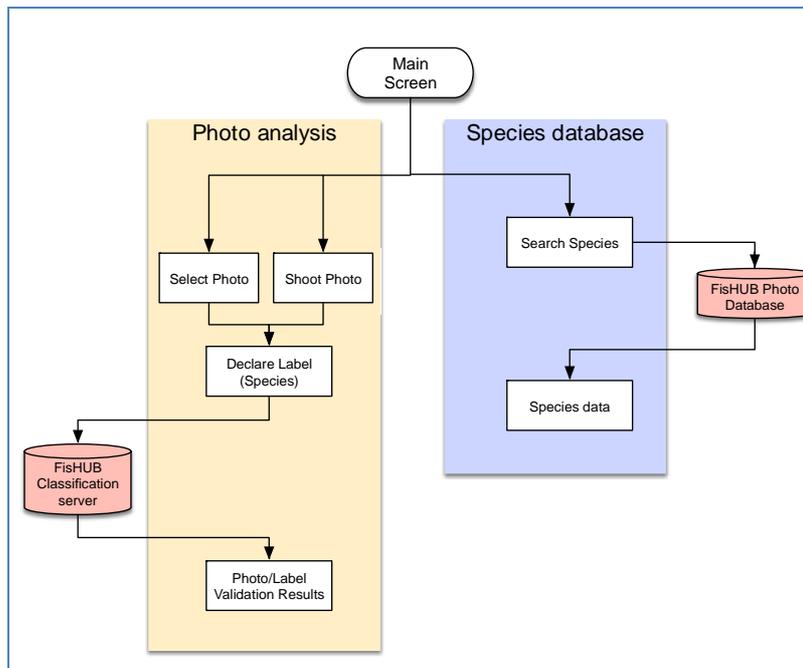Figure 1 shows the organization of the two functionalities implemented by the FisHUB App.

Figure 1: App storyline and functionalities

The App does not require any kind of authentication. The access to the FisHUB database and classification server is anonymous (only the IP addresses of the device running a photo analysis flow are logged for security purposes).

Achievement of the Deliverable

This section describes in details the different screens available in the App.

The App icon that appears in the mobile device dashboard is a simple stylized Fish (Figure 2).

Figure 2: FisHUB App icon

The initial Splash screen (Figure 3) that appears for a few seconds after launching the app shows the FisHUB project partner logos as well as the FoodIntegrity logo.

Figure 3: splash screen

Photo Analysis flow

As soon as the App is ready it immediately allows the user to start with a fish identification/analysis flow (Figure 4). Before submitting something to the FisHUB server, the user has to complete two tasks:

1) Select the image source by clicking one of the two round buttons, and
2) Select the species that the user is submitting (typically the species that is reported on the mandatory label in the marketplace) by clicking the "Select Species" button.
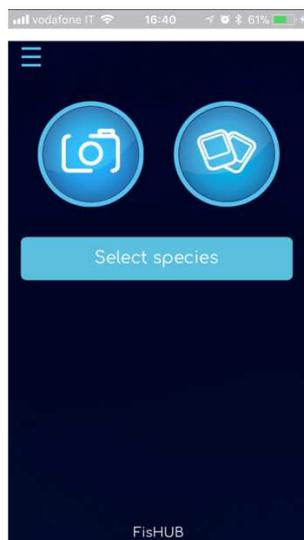

Figure 4: initial screen

The two operations can be completed in any order, but the submission to the server is not possible until both tasks are completed.

If the user selects the mobile phone camera, the default operating system camera tool (Figure 5) allows the user to take a square picture (the square frame is consistent with the shape of the pictures in the FisHUB database and cannot be changed).

Alternatively, the user can select a previously taken picture from the mobile phone Camera Roll.

Figure 5: default camera plugin

After this phase the two buttons are replaced by a thumbnail of the selected picture (Figure 6).

Figure 6: home screen after selecting a photo

The second required step is the selection of the fish species. After clicking the "Select species" a popup appears where the user can search and then select the desired label (Figure 7).
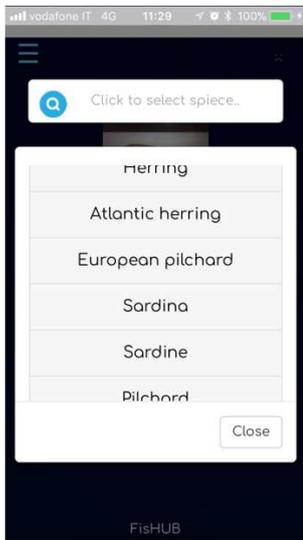
Figure 7: species selection

After selecting a label, the "Analyze" button appears (Figure 8). By clicking it the image and the label are sent to the FisHUB classification server for validation.

Figure 8: home screen before launching analysis

A soon as the result is received from the server (a few seconds in the worst case), the results of the validation process are displayed (Figure 9):
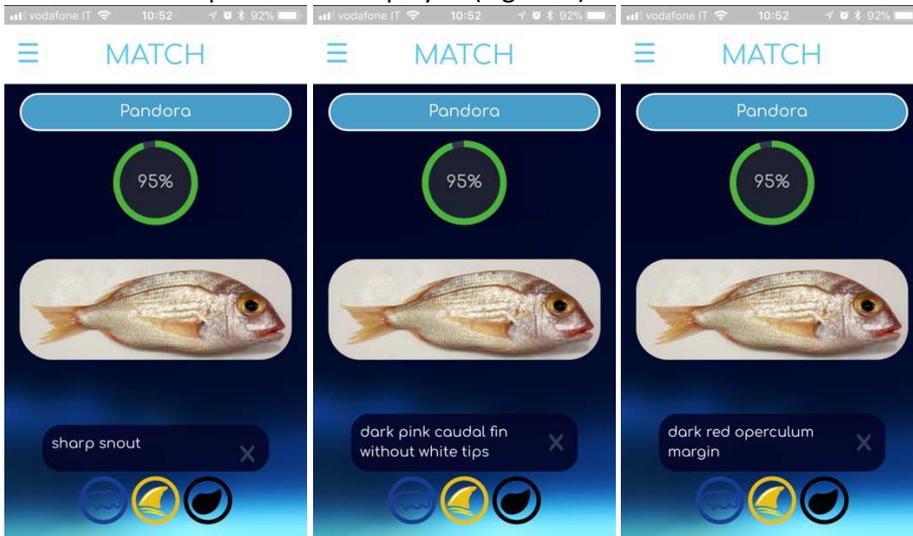

Figure 9: results page

Four important information are displayed on this page:
1) The original label (in the blue rounded box);
2) The **probability** that the analysed picture actually matches the species declared by the label. This information is reported inside a green circle if it is > 80%, in a yellow circle otherwise;
3) A reference picture of the declared label, taken from the FisHUB database;
4) A set of icons that, when clicked, explain the particular morphological characteristics of the selected species. The meaning of the icons is reported on the "Legend" page (Figure 13), accessible from the main app menu.

Species Database

The App also offers the user the possibility of browsing the FisHUB database in order to learn morphological information about the species present in the FisHUB photo database.

To access this functionality it is necessary to click on the "Guide" link accessible in the App menu (Figure 10), accessible by clicking the hamburger button present in the top-left corner of all App pages.
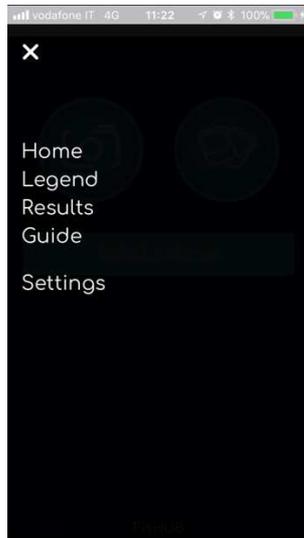

Figure 10: menu

The "Guide" link takes the user to a page where it is possible to scroll through the list of all the species that the FisHUB server has been trained to recognize (Figure 11). By clicking on a species name, the App will query the server and return to the user a picture of a representative fish (taken from the database) and, if available, some particular morphological characteristics of the species itself, just like in the Results page (Figure 12).

Figure 11: list of available species

Figure 12: Species details

Other secondary functionalities

At the moment the Hamburger button allows five possible choices:

1) **Home**: it takes the user to the initial page where to start a **new** analysis.
2) **Legend**: it takes to a static page (Figure 13) explaining the meaning of the icons that describe, in the Guide and Results pages, the morphological characteristics of each species.
3) **Results**: it takes the user to the results of the last analyzed image (if available).
4) **Guide**: it allows to browse the FisHUB photo database.
5) **Settings**: it allows to select the app language (the available languages are English

Figure 13: legend

Implementation Details

The FisHUB app was designed using standard html/javascript/ajax technology on the client side, and Php scripts on the server side to interface with the FishHUB photo database and classification server.

On the client side (App) Bootstrap 4.0 has been chosen as the main front-end component library. To create the App the code was wrapped into Adobe PhoneGap, a powerful framework that allows to create cross-platform apps using HTML, CSS and Javascript. In particular, the App was generated for IOS and Android devices. The App required about 1500 lines of code.

All data (photos, species descriptions, …) are stored on the server side of the App. In this way future updates and improvements of the FisHUB server, species, or species descriptions will not require the deployment of an updated version of the App.

The UI interface design as well as logos and graphics have been developed by two students of the Degree in Design and Visual Communication of Politecnico di Torino as their bachelor Thesis.