University of the Aegean

Information and Communication Systems Engineering

Design and Development of Mobile Computing applications (321-9120)

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Course project specifications

Delivery deadline: 14/01/2024

OrgOMa: Organic Olive Management app

Introduction

During the fruiting stage of the olive tree, regional agricultural departments are spraying for the Dacus flying insect which is the main adversary of the olive tree. The whole process is supervised from an agronomist of the regional agricultural department. The spraying process is being assigned to one or more workers.

But in organic olive groves, no such spraying should take place, since different methods are being used.

The proposed mobile app will record the olive groves and which of those are organic so as the workers can get notifications when approaching organic olive groves and not perform spraying in these areas.

This project can be implemented from maximum 3 students, depending the specifications the will implement.

Requirements

Smartphone app (teams with 1-2 persons)

1. Publicly accessed map displaying olive groves by using markers. By using different color it will be identified if a grove is organic (green scale) or conventional. The conventional will also have a different color when the are identified by the workers as sprayed.
2. Account creation for worker role (spraying worker) by email and by one of the following 2: Facebook Login SDK or Google Identity Platform. The connection should stay active for some days.

3. Form for inserting an olive grove with owner details, olive varieties in the grove, if its organic or not, and a set of coordinates of the grove (set of longitude and latitude). For a grove this could be one or more, depending the size of the farm. For instance it could have coordinates for each corner of the polygon of the grove. This can be done by using the location of the device or (better) by the user marking the coordinates on the map.
4. Save and edit of grove
5. The app will track the location of the device for users logged in as workers. Each time that the device's location will be near an olive grove, 20 meter and less, the device will get a notification warning him/her that he/she approaches an organic olive grove.
6. Regarding the rest of the olive groves, the conventional ones, when the device is close to 10 meters or less of a grove (a coordinate which is part of a grove) the app will change the status of the grove to "sprayed".
7. A Central Database (not a locally installed on the device) which will contain all the info that should be stored according to the above specifications.

Back-end (teams with 3 persons)

1. Publicly accessed map displaying olive groves and their status (organic or conventional, sprayed or not)
2. Logging in for administrative user (agronomist of regional agricultural department)
3. List of all sprayed olive groves and the details of the owner (olive variety, owner, conventional or organic grove). Filtering by using either variety or type (whether its organic or not).
4. Ability to change the type of a grove (Organic to conventional and vice versa).
5. Statistics page (using charts) showing how many olive groves are organic or not, how many or the conventional are sprayed and not.

Technologies and tools

You can use the following technologies:

For the back-end you can either use:

1. A traditional approach by using a localhost or remote (available if you ask the lab staff) server e.g.
    1. Apache web server
    2. MySQL relational Database
    3. PHP for imoplementing middlewara API (or REST API)

    4. JSON/XML for data interchange
2. A cloud based technologies which could facilitate:
    1. Javascript
    2. Ajax
    3. No-SQL database (JSON)
    4. Firebase Cloud messaging and Firebase

For the smartphone app you can use on of the following methods:

1. Android Studio for native Android App (Kotlin/Java)
2. Xcode for native iOS app (Swift/Objective-C)

if your team implements both back-end and mobile app, both should communicate using the database that you implemented and the API calls for the functionalities described above.

Deliverables

The project can be implemented of teams up to 3 persons.

Accept the project by creating a team through GitHub **here**.

The deliverables should be delivered through GitHub by uploading the source code and other files of your project which are:

1. Source code of the mobile app (src folder in GitHub) and the app itself (.apk file).
2. A docx, odt or pdf file (report folder in GitHub) with use case diagrams of your proposed system. You should include actors, use cases and their associations. Also include a description of how your system implements the specifications. Finally, include an ER diagram of the DB or the structure of the DB (in case of JSON DB). In each case, include which technology and tools have been used and installation and running instructions.
3. A video which will demonstrate the functionality of your app in a mobile device. The video should be at most 2-3 minutes and should be demonstrating in a clear way the functions of your app and the changes happened in the DB. You can upload the video in the cloud (e.g. YouTube) and include the link in the GitHub. Video is mandatory for assessing your project.
4. Oral examination including all the members of the team lasting 15-20 minutes in available slots you can find **here**.

Assessment criteria

Criteria	weight (1-2 persons)	weight (3 persons)
1. Smartphone app	75%	55%
2. Back-end		25%
3. Data Base	15%	10%
4. Report	5%	5%
5. Video	5%	5%