ISEL
INSTITUTO SUPERIOR DE ENGENHARIA DE LISBOA

Desenvolvimento de Aplicações Móveis
Mobile Application Development
DAM

Final Project - App

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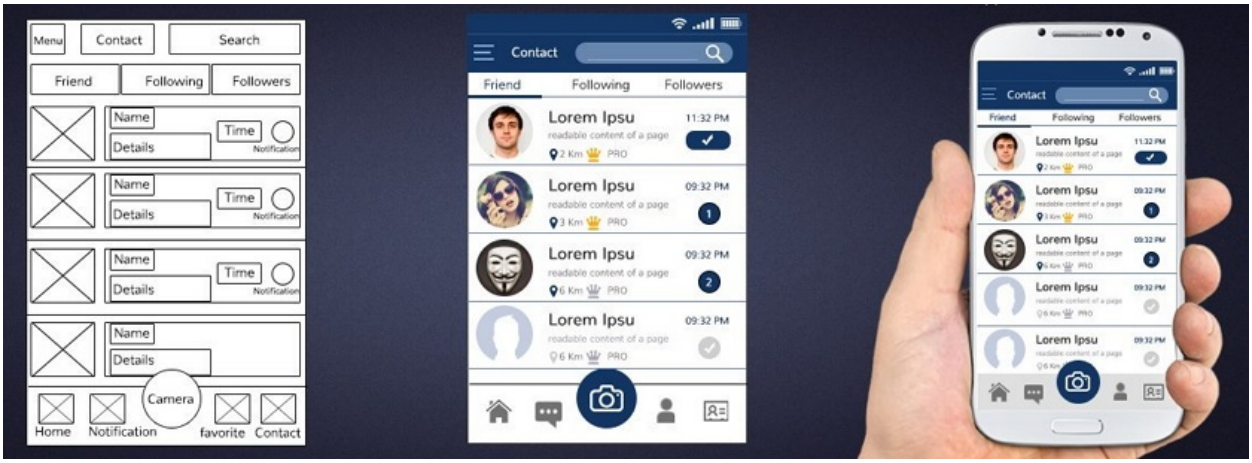
Abstract

This type of final project aims to develop an Android application, based on a Business plan and using a development process centred on the user experience.

Deadline: July 31st, 2020



Android Application

May 21st, 2020

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1 Introduction

This kind of project aims to design, implement and evaluate an application for mobile devices with the Android operating system.

The development process should follow the methodology centred on the user experience, analysed for Games in UC slides, which has the phases of:

1. Concept;
2. Pre-Production;
3. Production; and
4. Post-Production.

The application should have a business plan since from the beginning. The app concept should be conceived to have at least one key feature to engage users to pay a certain amount (assume 1€) per month to have access to that feature. An example is an App Beach, used to register beach access, where payable users can have access to history data. All users can reserve places in the beaches, but only payable users can see the beaches state in last days (1 week) .

The application must use the Firebase platform to **save application state** and to share it between users. Students must be proactive and self-sufficient to gather all the necessary information to use this platform through on-line information (documentation, examples and forums).

Students must deliver a fully functional marked-ready version of the application and evaluate it in terms of usability, functionality and business model.

2 Application Grading and Features

The developed application will be **graded** based on the following **guidelines**:

- Application **based on an existing application**
  - Minimum features graded to **13**/20
- Application **based on an existing application**, but with **significant variations**
  - Minimum features graded to **16**/20
- **Original application**
  - Minimum features graded to **18**/20
- **Extra features** add up to 1/20 for each feature, over minimum requirements grade

- Features are evaluated in terms of its originality, complexity and implementation quality

The application **minimum requirements** are:

- Code from scratch - you should build all the code
- Must have user **login**
- **Firebase** support to save application state
- Must have at least **3 significant activities**, with the use of passing and return of values
- Must have at least **one animation**
- Must have start menu, help, about (with author identification and photo), settings (account information) and multilingual support for Portuguese, English and one more language (use a translator).

The application **extra features** may be:

- Be **CoViD related**
- Include multimedia content: video, sound, more animations (of different types)
- Use location awareness or location services

An extra feature may be a group of requisites, not just one single item. Any extra feature must be approved by the teacher.

3 Development Methodology and Scheduling

The application should be designed and implemented focused on user experience and on a business model. Students should see information (related o games) in class slides.

The application development should abide by the Development Methodology introduced for Games, in the slides, and respect the following requisites and dates.

3.1 Concept phase - application concept

This phase aims to define the **application concept** and its main artefacts and study and test new technologies that will be used. For this phase it is required:

- Define the **name** and **general concept** of the application

- Define *app* main characteristics (entities) and functionality
- Define *app* main audience/users
- Identify at least one **key feature** that will engage users to pay a certain amount (1€) per month to have access to that feature
- Make *app* **wire-frame**
- Build *app* navigation map (wire-frames and navigation)
- Build the **Application Concept Document**(**ACD**) with 2 to 4 pages
- Get **teacher approval** for *app* concept, business model and extra features - **this is mandatory** (without teacher approval students cannot proceed)
- Define the Entity-Association diagram (without attributes) for the *app* database to be used
- Create a **Firebase** project (https://firebase.google.com) and implement a Firebase Android client test application with user login using Firebase User Authentication with Email/Password and, optionally, as an extra, with another third-party authentication provider such as Google, Facebook or Twitter (worth 1/20 points)
- Make the changes to enable the **Firebase Android client** test application to save and get text and images.
- If the *app* will use other technologies not tested in the classes, the student should present a minimal report with an initial test (like a "Hello World" with caffeine) of each one of them
- Build a **report** with all these points

The documents and artefacts produced should be delivered until June 14^{th}, 2020.

3.2 Pre-production phase - application details and initial prototype

This phase aims to define all **application details** and produce an **initial functional prototype**. For this phase it is required:

- **Make user evaluation**, questioning 4 users (minimum). After a short introductory explanation, ask them to see the wire-frame layouts and read the concept document and then to share their feedback, answering these questions:
  - What is the purpose of the application?
  - Was it easy to get the application concept?
  - Do you think it is appropriate for the target audience?
  - What do you think of the application in general?
  - Do you like it?

  - Would you use it?
  - Do you think there is any unsuitable element?
  - What would you like to see changed is the application?
  - How much are you willing to pay (monthly), to have access to payable features?
  - What are the payable features you would like to be added and you would pay with a smile?

- Improve the application concept and details, based on users feedback
- Design *app* **mock-ups**, using a prototyping tool of your choice
- Define the *app* users profiles
- Define the **full Entity-Association diagram** for the Firebase database
- Build the **Application Design Document** (ADD)
- Build a **minimal *app* version** (prototype) with all existing activities, with minimum and rough elements, only to enable navigation between activities. Use hard-coded (simulated) data, if needed.

The documents and artefacts produced, in this phase, should be delivered until June 28^{th}, 2020.

Students should finish the first two phases as soon as possible, in order to have more time for the final phases.

3.3 Production phase - pre-market version

This phase aims to focus on the **development of the *app*** and should end with a **pre-market *app* version**. For this phase it is required:

- Complete the layouts
- Build *app* auxiliary classes to handle existing data
- **Build the *app* pre-market version**, which should support all *app* main aspects
- Make **production usability evaluation** with at least 4 users (not from the concept ones), with these questions:
  - What are the actions you can do in the app?
  - Enumerate the app screens?
  - Which screens did you spend the most time on?
  - What screens did you skip?
  - Did the navigation flow as expected?
  - Would you like to change the navigation flow?
  - Do you think the app is difficult than use?

  - Did you find any situation that frustrated you?
  - Which parts of the app would you like to see improved? How?
  - How much are you willing to pay (monthly), to have access to payable features?
  - What are the payable features you would like to be added and you would pay with a smile?

- **Refine** *app* if needed

3.4 Post-production - market version and final report

This phase aims to **finish *app* development** and end with a **ready to market *app* version**. For this phase it is required:

- Add *app* **final details** (multi-language, help, about, settings, ...)
- Make **post-production usability evaluation**, repeating the production questionnaire with at least 6 users (not the same that already answered)
- Create the **final report** with all the documents

The final report and app market version must be delivered until July 31^{st}, 2020.

4 Final Report

The final report is mandatory and should include:

- introduction to the work
- the entire application development process
- initial wire-frame diagrams
- initial mock-ups
- final screenshots
- final full entity-association diagram of database
- final full data-base schema (no data)
- final full UML class diagram
- results obtained
- discussion of the most important issues
- conclusions

It should also include, in appendices, all the documents produced throughout the application development (e.g., the concept document), which should be referenced in the report chapters as outcomes of the work, at their time.

5 Submission and Evaluation

The final evaluation of the work will be done after delivery of the final project (app marked version and report).

The final grade of the curricular unit includes all the grades of the tutorials executed during the semester and the final project (final product and report) and it is obtained in an oral discussion.

The submission of the work includes the report in digital format and the source code of the application and should be done: through the Moodle platform if possible; if not (due to the size limitations), through the OneDrive. If OneDrive is used the students must also deliver a zip, in Moodle, containing the link to the OneDrive zip file and the report (PDF) if possible.

6 Wire-frames, mock-ups and prototypes

A **wire-frame** (or wireframe) is a rough **sketch** about how a website/app/game will look like. Usually is conceived in black and white, and focused on contents, not on visualization details. It should describe the existing screens, their contents and navigation details. It should be rough, to avoid waste time in details that could reveal to be not suitable.

Figure 1: Wire-frame.

A **mock-up** (or mockup) is a high fidelity wire-frame. It focuses on the visual aspects, like colours, shapes, effects, spacing, text and form style and navigation. It should offer a complete visual guide for the prototype phase.

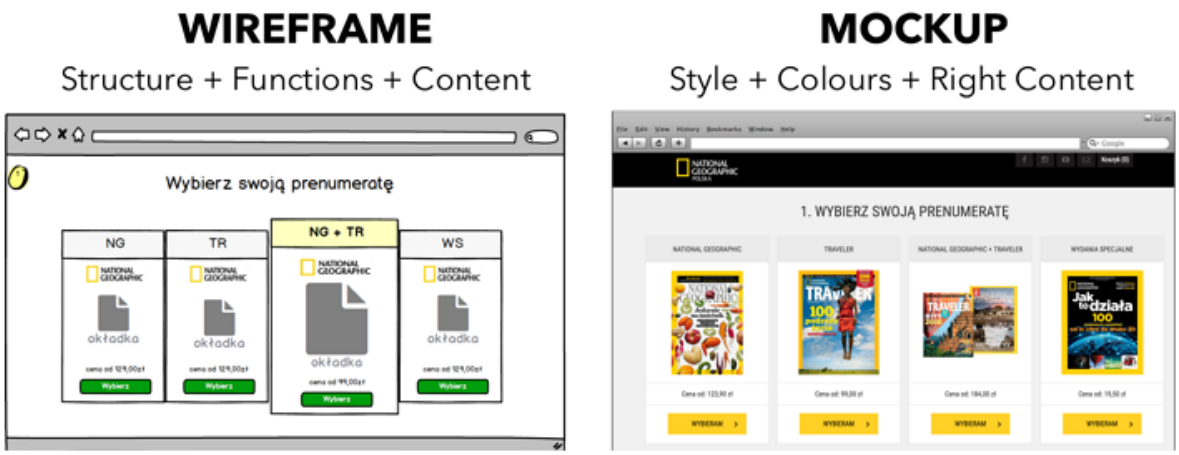

Figure 2: Wire-frame and Mock-up.

A **prototype** is a real implementation of the product, but in an early stage. It should implement, incrementally, the major use cases. Then, it should evolve to contain all of them.

Note: information and images from: www.mockplus.com and /www.fiverr.com.

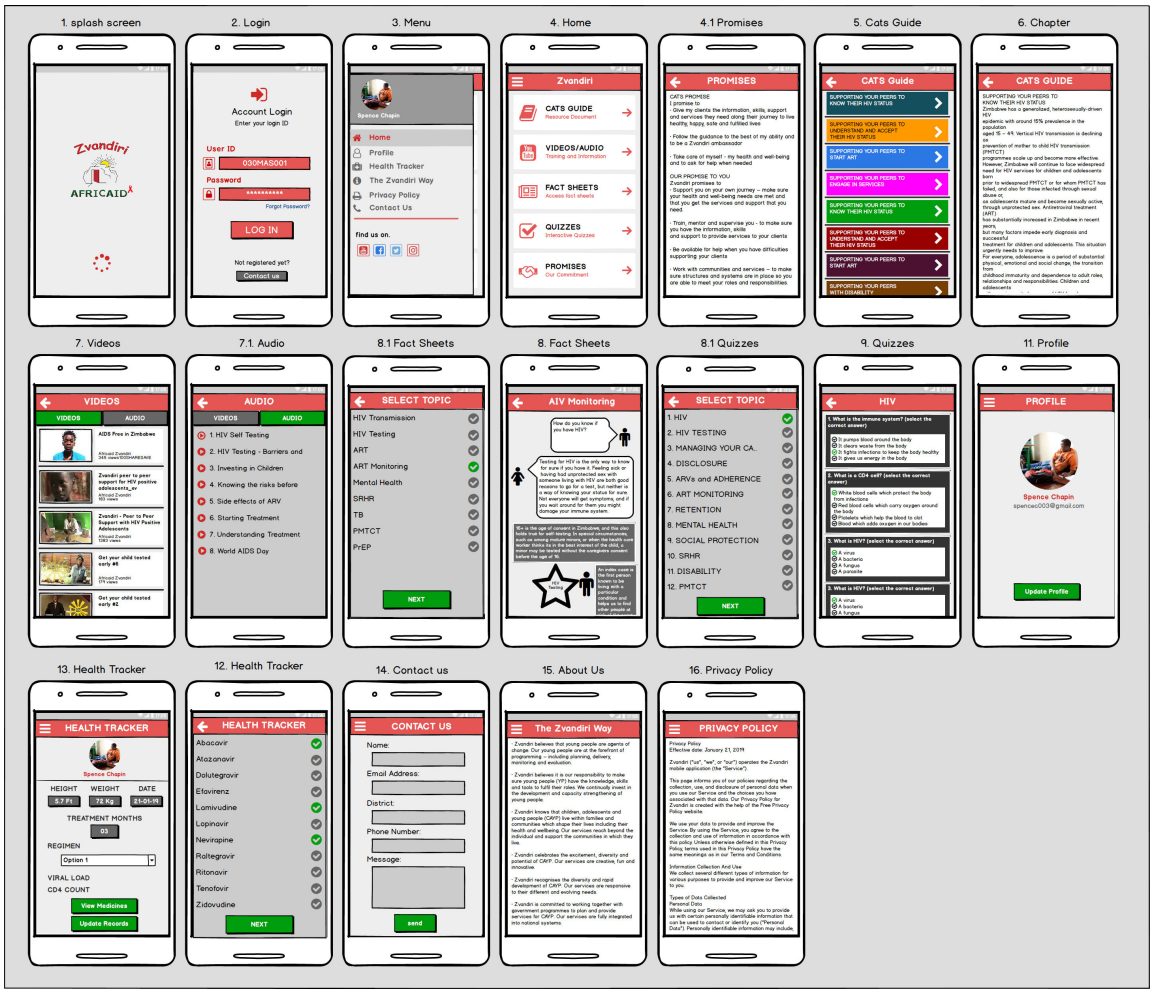

Figure 3: App full Mock-up.

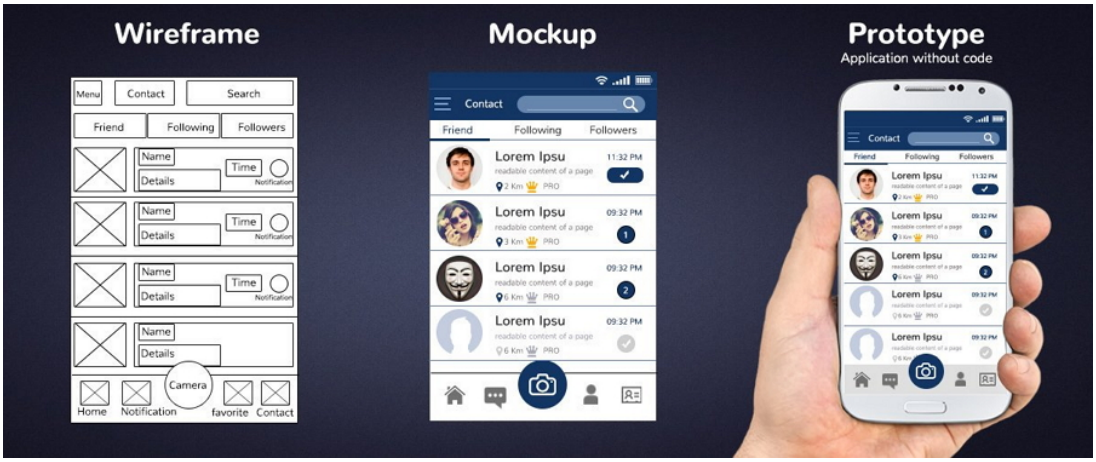

Figure 4: Wire-frame, Mock-up and Prototype.