

Botanic: New Directions in Mobile Research

1. Introduction

In this report we will explain how we translated our research into a real application and how the process was conducted. In the next section we will explain in what consists this application and the main reasons that led us to create it. The third section will cover the beginning of the development process, from the first brainstorming sessions to the definition of the general concept and functionality guidelines. The fourth section contemplates the phase of deployment and testing, in which we made internal evaluations as well as Ad Hoc tests with selected users, and worked on the promotion and distribution of the app to a wider public. In the fifth section we will address the process of refactoring and targeting that took place after evaluating the results of the previous phase. The sixth and seventh sections contain our conclusions and the list of reference documents, which complement this report.

2. About Botanic (*general description - what, what for and why*)

In this section we will describe briefly the app's nature, our motivation to create it and the main decisions that guided the conception process.

2.1. What is Botanic

Botanic is part of a project that focuses on exploring the impacts and potentialities of the Augmented Reality technology applied to mobile devices. In short words, it is a mobile application for iOS that aims at three main points:

1. Providing information (both practical and recreational) about Rio de Janeiro's Botanical Garden;
2. Supplying a navigational tool to allow users to explore the place;
3. Allowing users to produce, record and share data with peers. (*what and what for*).

2.2. Motivation

The motivation to develop it came with the desire of experimenting new mobile technologies that would serve real users and have a clear and practical purpose. We perceive Botanic as a ground for experimentation and research on new technologies and tools, but we also believe that the outcome of this project can transcend the academic field and become a product supported by institutions or companies, being thus part of an innovation cycle.

The choice of the theme for the app came after an extensive research [1], from which we realized that, when it comes to mobile applications that focus on places in general, there are basically two types:

- Those like Waze, which deals with navigation in a macro way (i.e., it takes into consideration large areas, such as cities and even countries) and has solely practical purposes (it is a tool that helps users to get from point A to point B);
- And those that privilege content (be they recreational or informative) and deal with smaller, indoor areas. Such would be the case of a museum app that shows the ongoing exhibitions and activities, but does not provide interactive navigational tools (probably because roofed areas are difficult to be reached through GPS, and because the area does not justify the need for a more complex navigational system).

We wanted to mix these two different categories in an app that would deal with navigation by making use of all the resources available and to provide interesting and relevant content that would be recreational (and not just utilitarian). We wished to enable macro and micro exploration of a specific/controlled area that would not only be rich in information but also have a diameter large enough to require navigational tools.

Rio de Janeiro's Botanical Garden is the place of our choice for having all the desired qualities: It is one of the most visited attractions in the city, receiving annually over 600 thousand people (and nevertheless, the place so far lacks its own mobile application); it is also a prominent center of study and research; it has many cultural attractions that go beyond the botanical field and distinguish it from other parks and gardens, such as the Tom Jobim Space and the Environment Museum. Finally, the geographical proximity to Impa, making it easy for us to do tests in loco, and the close relationship between the Visgraf Lab and the Botanical Garden were also determining factors.

The number of mobile applications for botanical gardens has been growing rapidly since we started our project. During the conception phase, our research on similar apps [1] resulted in only two of them (Kew Gardens and Chicago's Botanical Garden), and both at a very incipient stage. At the time this report is being written there are already more than ten similar apps available on the App Store. This shows that our initiative is consonant with what can be considered a global tendency.

However, there are many features that differentiate Botanic from all others. While most of them tend towards one approach or another in regard to the content (i.e., there are those which privilege the presentation of a closed and edited content to users, opposed to those that focus solely on the creation and sharing of content by users, such as Instagram), Botanic has both. We decided to put together features that combine information with navigational tools and also the possibility for the user to produce and share data – and all these associated with state-of-the-art technologies applied to the fields of Augmented Reality and digital panoramas, just to name a few.[3]

3. Development

In this chapter we will explain the steps taken in the development of Botanic, that can be summarized in this list:

- 3.1. Brainstorming
- 3.2. Development strategy
- 3.3. Work on the functionality of the app
- 3.4. Content generation and organization

3.1. Brainstorming

During this first phase, we collected data and references about the existent mobile platforms, applications and tools.[1] [2] This research lead us to decide to develop for Apple's mobile operating system – the iOS – and, more specifically, to iPhone devices. The reason is because that device has all the features required for the experience we wanted to provide (such as a GPS locator, access to internet, camera and so forth) allied with the convenience of being lighter and easier to carry than the iPod.

The list of functionalities [3], mindmaps of the structure [3] and our research on similar apps [1] and visual references [2] can be more thoroughly analyzed on the supporting documents.

3.2. Development strategy

The second phase consisted of determining the development strategy of the app. After having chosen the iOS, a research on the system's existing tools and resources was carried out. The survey indicated which functionalities would have to be developed from scratch, and which ones were part of the default features. That prevented us from being redundant and wasting our efforts on things that might already have been done. Nonetheless, it is important to mention that our contributions still had to be synchronized with Apple's default features. The company itself is constantly adding features to each version of the iOS, which means that it is possible that we develop the same kind of tools simultaneously.

This reflected also on the way we dealt with the interface, as will be explained in the next section.

3.3. Working on functionality

With the basic strategy set, we started to devise how each function would work, incorporating many iOS functionalities that were cogent to our objectives.

This was accomplished in two successive moments. A general description was first made of what would be present in each screen, using basic drafts to visualize a first conception. This process can be seen on the first draft [5]. A second draft [6] was then made with more details in each view and already presenting a navigation structure for the screens, as well as ideating some animations for the opening screen. The desired navigation would have a progressive presence of the content as the user drilled down the hierarchy, using less interface objects at each step taken.

It was necessary to devote a special attention to the navigation tool. We needed a map of the Botanical Garden for the users to explore, but, after analyzing the digital maps provided by Apple, Google and the official map of the Botanical Garden, it was clear to us that we would have to add many features to whatever map we chose to use. In the end, we decided to use Apple's mapping tools with the Map Kit resource, but it was necessary to remap all the regions, paths and sites on our own vectorial map, associated with a geographic database. This process can be assessed on [8] and [7].

3.4. Content generation and organization

Parallel to the development of the app itself, the team worked on organizing the content that would be provided by the application. Some of the content was extracted from the book “Meu Querido Jardim Botânico” as part of the partnership with the Tom Jobim Institute. The poetries were assembled and digitalized, both in Portuguese and in English, and the structure of galleries created to display Zeka Araújo's pictures can be seen on [4].

The practical information was assessed from the official websites of each institution, with links to the original pages and the sites and mapping information were also generated based on Botanical Garden's official maps and its website.

4. Deployment and testing

4.1. Internal evaluation

As soon as a first version of the App was ready, a first heuristic evaluation of the interface [11] was made by the team. The points made in this process were discussed and the necessary changes were incorporated on the product, also having an influence on future developments.

The results of these improvements can be seen on the detailed description of the App's second version [7].

4.2. AdHoc Tests

An ad-hoc distribution was then made of the improved version. Since the product was still at a very incipient stage, it was decided that the distribution would be made to a selected public, that would be more involved in basic stages of conception. A small sample of designers, frequent visitors of the Botanical Garden and of its employees were selected for this evaluation. A questionnaire was then presented to these users, which gave us some first user responses [13]. The questionnaire was also applied on Paulo Jobim, a partner at the Jobim Institute and also Tom Jobim's son. His suggestions [12] also helped us on our process.

4.3. App Store Distribution

After all the alterations were finalized, a first official version was released on the App Store [14].

4.4. Promotion

In order to publicize and introduce Botanic to the world, some marketing actions were taken.

The first channel created was the website [10], alongside the presentation video [9], which explained the functionalities and set the theme for the app's user experience.

With a central information point established, other media was employed. The first action was an e-vite to a selected group of people, which generated newspaper articles and an insert on a design newsletter. Finally, a flyer and a poster were created for distribution at the Tom Jobim Institute, IMPA and other interesting sites.

More information about this process can be seen on the publicity report [15].

5. Refactoring and Targeting

5.1. Visual Style

At the beginning of the process it was decided that the styling would follow a line of visual simplicity and that many default iOS resources would be used in the final product. With that in mind, the first versions of the app concentrated on usability and functionality. After the basic structure was developed and tested, the team resumed with the visual styling per se. This process can be analyzed on a descriptive report [16].

5.2. Next Steps

Although the visual styling has already been implemented, there will be some improvements to make and incorporate on the app after an evaluation. Once this process is finalized, a test will be made in loco, allowing the team to evaluate all of the app's functionalities on a simulated visit to the Botanical Garden. Tests with real users will also help on improving the user experience and interface design. The app will also be complemented with more interactive and artistic content, strengthening the relationship with the Tom Jobim Institute.

6. Conclusions

Even though Botanic has developed many resources and functionalities, there are still some functions that can be implemented in order to improve the user experience, especially those concerning content sharing.

The project is a work in progress, with many improvements and possible new functions even after several months of development. The possibilities go beyond the iPhone application, reaching actions on social networks, data and map sharing and even inspiring the creation of new applications.

7. References

[1] Research on Mobile Augmented Reality Apps

[2] Visual and Interface References

[3] Botanic Data Model and Mindmaps

[4] Galleries

[5] Botanic - 1st draft

[6] Botanic - 2nd draft

[7] Botanic - App version 1.0

[8] Mapping of Jardim Botânico

[9] Video Storyboard

[10] App Website

[11] Heuristic Evaluations

[12] Suggestions of Paulo Jobim

[13] Ad Hoc Distribution and Tests

[14] App Store Deployment

[15] Publicity

[16] Visual Style and Design