GinkoTempo for iPhone

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Abstract

In partnership with Ginko, we developed an iPhone application to complete their web service call Ginko tempo and optimise it for iPhone device. This was for us the opportunity to learn how to develop an iPhone application, how to use Objective-C and also how to use the iPhone SDK.

We produced an application in accordance with apple's ergonomics, with iPhone's look and feel, and which is pleasant to use. This project has been for us a great introduction on development for mobile device, and we tried to communicate our experience and enthusiasm in this present report.

Contents

Chapter 1

Introduction

This project is conducted as part of our Master degree to apply our knowledges in a concrete case. We were free to choose our subject and which technology to study. We decided to take the Ginko project to worked on mobile device as the iPhone.

During few last years, the iPhone appeared as a totally new way of communication. There is more than 140 000 applications available today for this device which answers to every kind of needs. Ginko wants to create a mobile application for his service "GinkoTempo".

Ginko is a transport company in charge of Besançon bus network. They build a web application called "GinkoTempo" [1] to have an instant access to the waiting time of every bus station. This application can freely be use with a simple internet connection but is not really adapted for small screen as mobile device. In partnership with Ginko, our goal was to create an application to complete this offer and help a maximum of users.

This report is a presentation of our work. First part is about which technology, tools and materials we used to develop this application. The next one present our final product, the GinkoTempo application for iPhone. Finally, we will have a discussion about the future of this project, and briefly introduce some user feedback.

[1] Available at the address http://www.ginkotempo.com

Chapter 2

Tools and technology involved

2.1 Methodology and good practices

The first step was to conduct a brief analysis of the subject. The objective was to completely understand users needs and develop the best answer. To help us, a Ginko developer followed our development and has attended to all of our meetings. He was also considered as our customer and defined all the technical specifications.

We first defined a list of functionality based on a list of use-cases. Users have to be able to consult :

- the waiting times of a station they know
- the waiting times of a station they will find from a specific line bus
- the waiting times of a station close to them (using GPS)
- the current traffic informations

But they also need to be able to :

- create an user account
- consult station of their user account
- add and remove a station from their user account

Once completed, we immediately started to study tools we would have to work with. We studied two systems : iPhone and Android tools (iPhone

OS[1] SDK[2] and Android SDK) which are both very different. We had to be efficient because of short work time available and had to decided how to start our development. Because of the short period of time dedicated to this project, we decided to first start with the iPhoneOS and next work on the Android one.

This was not an easy task because iPhone OS is develop by Apple with Objective-C language which was unknown for both of us. In compare, Android's applications use Java language which was study during our lectures and would be more easy to start with. One more time, we decided to start the iPhone application because is the most popular platform and so is the priority for Ginko.

An other difficulty was to communicate between our application and Ginko's server to access to their databases. To do that, they developed a web-service which is an open access to datas from the outside and showed us how to use it.

When all points had been resolved, we should start our development.

2.2 Material conditions

To develop an iPhone application, one obligation is to use an Apple computer. In fact, iPhone development tools are only available on Mac OS X[3]. Because the university does not have this kind of machine, we both had to use our personal laptop to do this.

As for our laptop, we both used our personnel mobile device, an "iPhone 3G" and an "HTC Magic" smartphone with Android. We only had one device of each type but this was not a real problem. In fact there is an application to simulate a mobile device and try our application directly on our machine. We only next discovered that iPhone OS simulator is a very light version of the OS and do not include some features as GPS or resources limitation. On the opposite, Android Simulator is way more efficient.

In more of the iPhone simulator, Apple propose a complete set of softwares to help us in our development. We first learned to use Xcode which is an IDE [4] made by Apple to develop their own application. This IDE is delivered with "InterfaceBuilder" which is a wysiwyg[5] interface editor. If this solution first looks easy to use, we quickly realised that it would be harder

[1] iPhone Operating System
[2] Software Development Kit
[3] Mac Computer Operating System
[4] Integrated Development Environment
[5] What You See Is What You Get

to use than to learn how to make an interface programmatically. We also discovered "Instrument" application which is used to analyse and optimised the comportment of our project.

To access to the Ginko's web service which use a protocol named soap, we had to find a software to create the links between our application and their server. We discovered that the iPhone SDK don't manage natively this protocol, so we had to find a substitute. Because it is possible to execute C++ source code in an Objective-C project, we decided to use an external tool called gSoap. This last one is able to generate the structure needs to communicate.

Finally, there is a specific protocol to be allowed to develop on the iPhone OS. Ginko had to buy a license and subscribe us as developers. Ginko gave us very quickly a certificate to install this application on our device and we could start in best conditions.

Chapter 3

Results of our Application

The iPhone development had been longer than expected. In fact, we had to learn how to use Objective-C and how to use the iPhone SDK. Apple provides a complete documentation about both of them but in a very complex and technical english language.

At the end of this project, we haven't been able to start the Android development. This was too much work to be realised in a so short period of time and so, we focused our development on the iPhone application. After eighteen weeks of work in parallels of our lectures, we finally obtained an application usable and quite efficient.

3.1 Presentation of the application

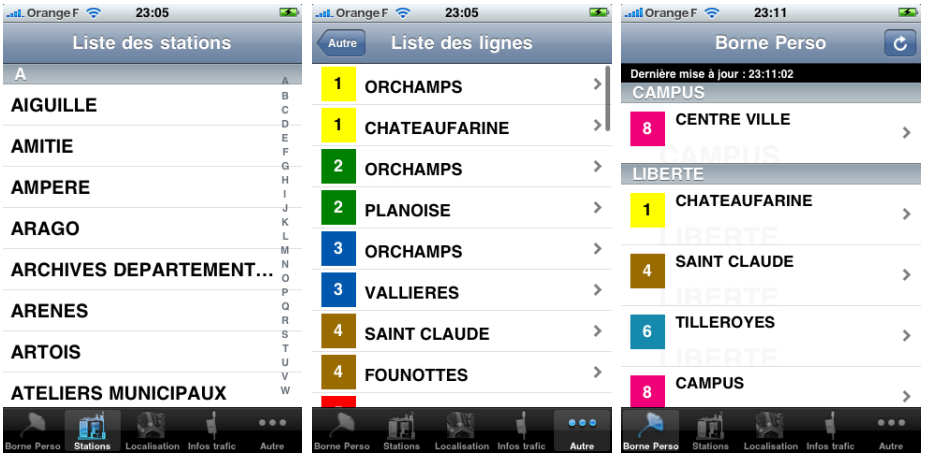
This is the main view of the application. For each bus line in a specific station, we display his number, colour, direction, and the waiting times for the two next bus - if there are available. This screen will be the main page which will be mainly consulted. If you select a bus line, you can access to some details as a description of the bus, eventually traffic informations relative to this specific line. Moreover, it is possible to add or remove this line from a user account - which will be explain in few pages.

3.1.1 List of stations

Users can access to a list of all bus stations. This is a list of station alphabetically ordered. Each station give an access to the waiting times of each lines.

3.1.2 List of bus lines

Users can access to a list of all bus lines. This list is numerically ordered and give an access to the list of stations deserved by a chosen bus line.



(a) List of stations (b) List of lines (c) List of the waiting times

Figure 3.1: Three different functionalities

3.1.3 GPS Localisation

Today, every new smartphone integrate a GPS to use localisation service. Users can use this functionality to find stations which are near to their current position.

3.1.4 Traffic informations

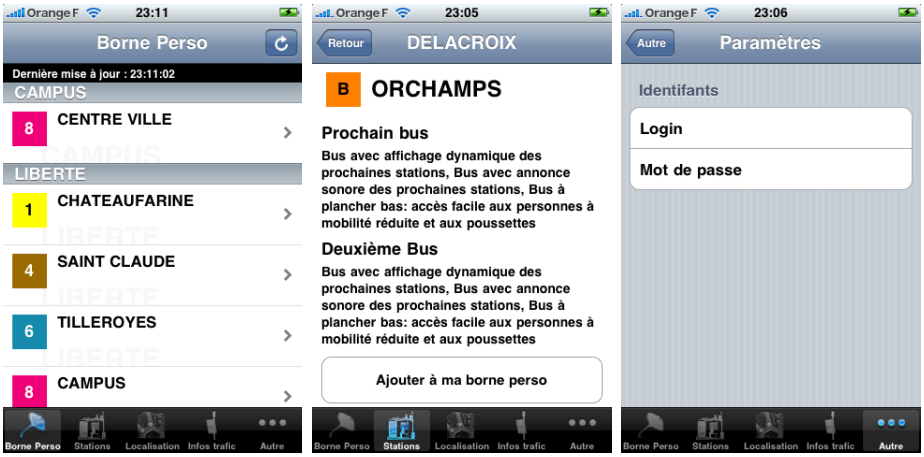
Users can consult traffic informations about the Ginko Network directly from this page. Each info is displayed by his title, if a user select one he can access to the complete message. Important messages are displayed in red and the number of them is highlighted in all the application.

3.1.5 User account

Users can create a personal user account to save their favourite stations and have a really quick access to them. They can use the application to create a new account which can be used on our application and also on the GinkoTempo website.

(a) List of traffic info (b) Complete traffic info (c) GPS localisation

Figure 3.2: Traffic informations



(a) The waiting times of a user account (b) Details of a waiting times (c) Setup a user account

Figure 3.3: This is an user account

Chapter 4

Discussion around our development

4.1 User Feedback

We took fifteen weeks to obtain an application. We only had few basic functionalities and didn't manage at all the user account, but had at this point some interesting results. We had to optimised the application to make it faster and user friendly. We worked a lot on the ergonomic in the aim to adopt the look and feel of the iPhone. This element was one of the biggest key point because to make a good application, people need to feel comfortable with it.

Quickly in our development, we showed the application to some developers around us, and for most of them they had been able to use it instantly. They recognised a good integration with the iPhone, fluid interaction and most of all, a clear simplicity. This was only a first and incomplete draft but results were encouraging.

When we implemented the capacity to use an user account, the application reveal all of his potential. For the first time, the application was completely functional and pleasant to use.

We didn't had enough time to realise a complete study but first feedback were really encouraging. This should be an interesting thing to do before starting to distribute it as an official application but we think everything is in place to have a good result.

4.2 Regret

The first topic of our subject was : Ginko App for iPhone, Android and Windows Mobile. There was technically no way to implement a unique solution so we had to work on three different softs. We first started with the most popular one ,the iPhone, but didn't had enough time to start an other platform.

In more, there is still some functionality which could be good to implement in a second time. A map with all bus stations could be possible to implement with the iPhone SDK. This could be a visual help to find a station and have an idea of the distance and the route to join it. It could be nice to implement a system alert. If an user need to take the bus, an alert prevent him few minutes before it comes. This could be relevant in some case, if you need 4 minutes to go to the bus station, you could optimise your route and save time.

A last thing, since we begin this product, a huge new product arrived on the market : the iPad. Even if our application is compatible with this device, our interface is optimised for small screen as the iPhone (3.5 in) and is not adapt for large screen (9.8 in). It could be comfortable to include in our application different visualisation mode depend of which device user is using. Thanks to the structure of our application, it could be possible to do.

All points will be report to Ginko and may be implement in a future version of the application.

Chapter 5

Conclusion

This project was an amazing subject for us. We were very enthusiastic about it and haven't been disappointed.

We had with this project the opportunity to work on a mobile device, and more specially the iPhone OS. Since few years, this is a hot topic because of the success of smartphones. This was a very interesting experience to work on this kind of project and gave us a good idea about it.

Development on mobile device as we did in our project is part of teaching in one of 2nd year in Master Degree proposed by our university. This project was also the occasion to discover this topic and will help us to make a decision about our future orientation.