



Family Parking Project

**Google Technologies for Cloud and Web Development
Workshop**

Engineering in Computer Science

La Sapienza University

Francesco Noblie

Giorgia Ramponi

Obaida Hanteer

Nazzareno Marziale

Mauro Piva

Abstract

FamilyParking is an application dedicated for the family for broadcasting the parking information of the shared cars among the members of the family. In other words, it keeps track of the last position where the car is parked and helps the family to find it easily and quickly.

All the user needs to do when he parks the car is to push the parking button, and as a result the position of the car will be flagged so all the other members can reach the car position when needed. The user needs to push the button also when he removes the car so the family will know that the car is not available now.

If the user's car has an embedded Bluetooth, he doesn't need to push any button when he parks the car or remove it in order to broadcast this information to the family, else the auto parking detection property of FamilyParking will understand automatically when the user parks the car or remove it and the rest of the process will be managed automatically.

If the user doesn't have the Bluetooth embedded in his car and he usually forgets to broadcast the parking position among the family members manually, the clever Parky property of FamilyParking will remind him by sending a notification whenever it understands that a parking of the car or removing has happened asking the user for his confirmation. The notification system is clever enough not to bother the user with a lot of notifications that are useless.

Keywords: Google maps, flag, family, manual parking, automatic parking, Bluetooth, Parky.

Table of Contents

| | |
|--|----|
| 1. Introduction | 1 |
| 1.1 Preface | 1 |
| 1.2 What is FamilyParking System | 1 |
| 1.3 Users | 2 |
| 1.3.1 Expected users | 3 |
| 1.3.2 Real users | 4 |
| 1.3.2.1 First use case | 4 |
| 1.3.2.2 Second use case | 5 |
| 1.4 Competitors' analysis | 5 |
| 2. Development Lifecycle | 7 |
| 2.1 Initial version | 7 |
| 2.1.1 Application overview | 7 |
| 2.1.2 Initial Testing results | 8 |
| 2.1.3 The feedback-based plan for the next phase | 9 |
| 2.2 Second version | 10 |
| 2.2.1 Application overview | 10 |
| 2.2.1.1 Signing in | 10 |
| 2.2.1.2 Adding new group | 11 |
| 2.2.1.3 Adding new car | 11 |
| 2.2.1.4 Enabling/Disabling Ghost mode | 11 |
| 2.2.2 Thinking aloud with users..... | 12 |
| 2.2.3 The feedback-based plan for the next phase | 14 |
| 2.3 Final version..... | 14 |
| 2.3.1 Application overview | 15 |
| 2.3.1.1 Automatic parking with using Google API | 15 |
| 2.3.1.2 Improving the design to increase the usability.... | 17 |
| 2.3.1.3 Change the strategy of managing groups | 17 |
| 2.3.1.4 Creating iOS version of FamilyParking | 18 |
| 2.3.2 Testing Results | 18 |

| | |
|--|----|
| 3. User manual | 20 |
| 3.1 Downloading FamilyParking application | 20 |
| 3.2 Opening the application for the first time | 20 |
| 3.3 Managing groups | 21 |
| 3.3.1 Adding new car and share it | 21 |
| 3.3.2 Attaching Bluetooth device with a car | 22 |
| 3.4 Manual parking and unparking..... | 23 |
| 3.4.1 Parking | 23 |
| 3.4.2 UnParking | 24 |
| 3.5 Enabling/ Disabling ghost mode..... | 24 |
| 3.6 Using the widget | 25 |
| 3.6.1 Parking | 25 |
| 3.6.2 UnParking | 26 |
| References | 27 |

1.1 Preface

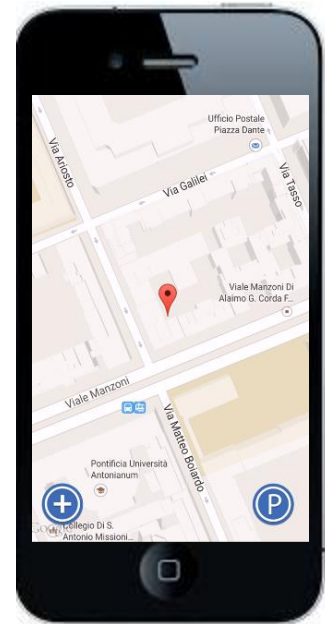
There is no doubt that the winning idea in the current era of the rapid continues development of the technology is not always the idea with the super creative features and the very exclusive properties, instead it is the one which simply solves one of the users real problems and satisfy his needs sufficiently no matter how simple it is. Thus, the importance of any new idea depends mainly on the importance of the user problem this idea solves. The evaluation of this idea, as a result, will be mainly based on how sufficiently the real application of this idea will solve this problem to the user. For example, a simple idea like "Whatsapp" with no new real invention in the idea, comparing to the previous messaging systems, to gain over than 600 million active users by October 2014^[1] means that no matter how simple the new idea is, the most important is to satisfy user needs cleverly and distinctly and to know how to add attracting features that cannot be found with the other competitors products. In this domain, family parking application is a simple application that solves one of the most important and frequent problems within the family life which is finding the position where the family shared car is parked.

1.2 What is FamilyParking System?

FamilyParking system mainly is a new solution to solve the problem of sharing a car among the members of a family. In such a case, where there is more than one member using the same car, the problem of finding the last parking position where the last one who used the car parked is a real problem for all the other members sharing this car. FamilyParking system introduces a new solution to this problem with a set of clever features that are interesting to each family to use in their daily life activities. Maybe it is the new positive member of each family having this

problem, the member who will have a very accurate memory, and a very developed monitoring system that let him always ready to answer every other member of the family when he ask “where is the shared car parked now?”. To make things more clear, we can imagine, initially, FamilyParking application as an application with a very simple interface working over Google maps application with two main buttons:

- **Parking button** which will be used by the current driver of the car once he parks the car as a way to inform the application that the current position where the parking button is pushed lately is the position that should be saved as the last place where the car was found, and this is the position that should be, in some way, published to the other members of the family who are willing to use the car in order to help them finding the car position easily.
- **Add member button** which can be determined, somehow, as non-functional part of the application since it is used just to add members to the family group to whom the last parking position should be broadcasted.



This is just for simplification, but the real implementation indeed guarantees these main functionalities in a different way. With such an application, the automatic parking detection is one of the most important and golden features that should be performed. This feature could be defined as the core part of familyParking system where it can detect automatically the action of car parking and then broadcast this position to the other members of the family sharing the car. So it is not required for the user to remember always pushing the parking button whenever he parks the car, because the application itself will try to detect that and do the parking on the application without the user interference.

1.3 FamilyParking users

Indeed, the idea behind familyParking was found after studying of some real users' problems when they spoke about their daily sufferings and time wasting just trying to locate the position of their cars in the morning since their cars are shared with

their family members. According to that, some statistics were done to expect who are the people that will be interested this app, and is it really worthy to invest in familyParking.

1.3.1 Expected users

Since the idea was born in Rome, and planned to be launched in Rome for now initially, the following statistics were done in order to expect the number of users for such an application.

The most recent statistics done in 2014 showed that the population of Rome reached 2,869,461^[2]. Knowing that the average of family members in Italy is 4 we can assume that the number of families in Rome is roughly equal to 717.365.

Supposing that each family of those has at least only one car and not all families in Rome use the smartphone. It could be considered that the expected users for the current phase when it is launched just in Rome will be, expectedly, more than 0.5 million families.

Speaking about some worldwide statistics, since the minimum platform used in developing the project with android is 4.0.3, then 91.8% of android system users are expected users for FamilyParking app in future [3]. And since the minimum platform used in developing the project with iOS is 4.0.3, then 91.8% of iOS system users are expected users for FamilyParking app in future ^[4].



Location in Italy
Coordinates:  41°54'N 12°30'E

| | |
|-------------------|--|
| Country |  Italy |
| Region | Lazio |
| Government | |
| • Type | Metropolitan City |
| • Body | Rome City Council |
| • Mayor | Ignazio Marino (PD) |
| Area | |
| • Total | 1,285 km ² (496.3 sq mi) |
| Elevation | 21 m (69 ft) |
| Population (2014) | |
| • Total | 2,869,461 ^[1] |
| • Rank | 1st, Italy |
| • Density | 880.92/km ² (2,229.78/sq mi) |
| • Urban | 3,800,000 ^[2] |
| • Metro | 4,200,000 ^[2] |
| Demonym | Romano |
| Time zone | CET (UTC+1) |
| CAP code(s) | 00100; 00121 to 00199 |
| Area code(s) | 06 |
| Website | Comune di Roma  |

Wikipedia - Statistics about Italy

1.3.1 Real users

1.3.2.1 First use case

Background


- 20 years old
- Bachelor student
- Doesn't have a car

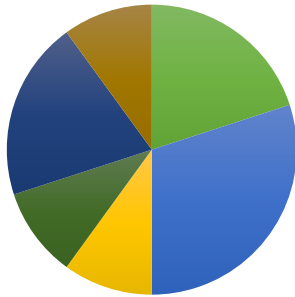
Motivations

- Being punctual all the time
- Being one of the top students
- Having a good personality

Frustrations

- Always late to his lectures
- Some problems with the family because of the shared use of the family car

Maurizio**Student**



| | |
|--------------|----------|
| Private life | Studying |
| Reading | Driving |
| Sport | Internet |

Lifestyle

Maurizio is an Italian student in the English literature department. He usually wakes up every day at 7:00 am, takes his breakfast, do his shower quickly and then go to his University.

Maurizio is a very punctual guy, he likes to sit always in the first row in his lectures to be closer to the professors. To do that he should arrive to the university around 8:00 am, and since the transportation in Rome doesn't follow a regular schedule, he used to use his mother car.

Maurizio used to return back home in the afternoon in order to return the car back to his mother since she uses it for going to her job in a clothes store. She is working for the afternoon shift where she start her job around 3:00 PM. They always finds problems when to find the car parking where the last one used the car parked it.

1.3.2.2 Second use case

Bob has a car which is shared with his son, Michel. Yesterday was the birthday of Michel's girlfriend, so he spent the whole night in her birthday party and returned back home quite late. Since the place where Michel used to park his father's car was busy that night, he parked the car in a new position where the father didn't used to park his car in.



The next day, it was raining heavily and Bob, who works as a sales manager, should arrive his job very soon since there was a new contract with a new customer.

Bob checked the position where he used to find his car parked, but he found it busy with another car. The son Michele is sleeping now and the father Bob didn't want to bother him. He simply picked his smartphone and opened "FamilyParking" application and tried to check the parking position of the shared car. He easily found a flag fixed on a Google maps like interface, and he followed that flag and reached his car. Thanks to FamilyParking application.

1.4 Competitors' Analysis

Indeed, the competitors for the FamilyParking software, when they are seen as one package, are integrating each other to perform what FamilyParking is performing, and studying each one them has shown that each competitor can serve as part of the functionalities performed by FamilyParking, but none of them offer the whole package together. With an additional main feature that is performed by FamilyParking without being found before with any of the competitors which is the

automatic parking detection. The following are the main competitors with a description of how FamilyParking differs from each one.

1- WhatsApp :



WhatsApp is an instant messaging app for smartphones that operates under a subscription business model. In addition to text messaging, it can be used to send images, video, and audio media messages. Locations can also be shared through the use of integrated mapping features. Using WhatsApp for sharing a car position could be a visible solution and accurate one, but in this way it is not so social and immediate since a lot of manual things should be managed.

2- Google now :



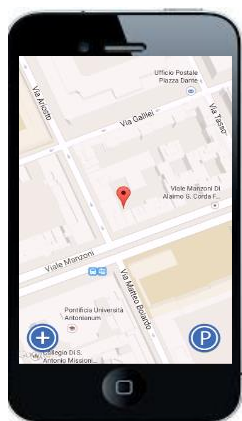
Google now an intelligent personal assistant developed by Google. It is available within the Google Search mobile application for Android, and iOS, as well as the Google Chrome web browser on personal computers. The problem with this software is that it is not accurate, and using it to do the same functionality of FamilyParking has proved low level of sociality and immediacy.

2.1 Initial version

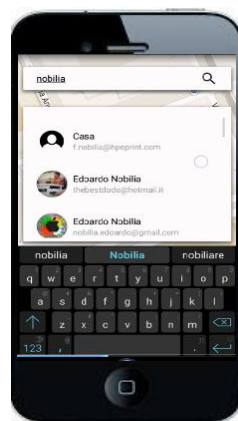
As mentioned before, the importance of a new idea in the field of technology is evaluated by the user problem it is going to solve and the needs it going to satisfy. As much user experience is included at the beginning, as much clear and direct implementation plan is gained. Having the idea of FamilyParking at the beginning was not enough to start directly implementing the project. As a robust base for the project, a decision of building an initial prototype for testing goals has been performed with a very simple prototype implementing the basic functionalities of FamilyParking.

2.1.1 Application overview

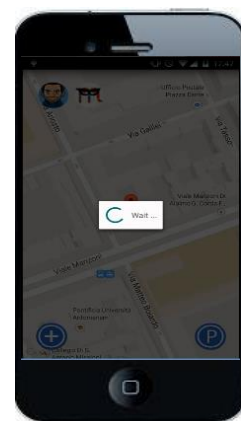
Since there are two types of users for the application from the implementation point of view, parker and car seeker. The first prototype was a very simple interface to be used by the parker in order to perform the parking manually. It just a simple **(1)** main interface with two buttons (+) to **(2)** add members to the family group and (P) button for **(3)** parking the car.



(1)



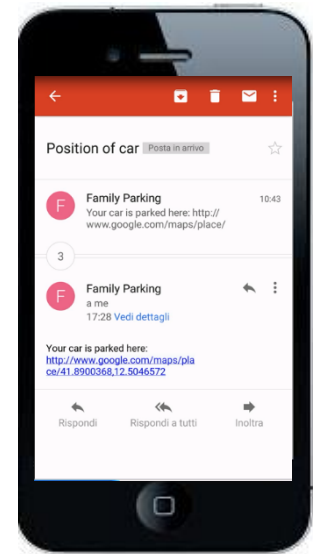
(2)



(3)

In the car seeker side, all he needs to do is just to check his email when he wants to reach the car. A Google maps link of the last position of the car will be mentioned in the email, and the user can use it to reach the car position.

By clicking on the car position link mentioned in this email, the user will be redirected, intuitively, to the Google maps interface where he can choose to walk towards the car position



Sending email interface

2.1.2 Initial testing results

Indeed the main goal of the prototype phase was to get a preliminary idea about the following issues in order to have a user driven product once the implementation phase starts. The following main questions aimed to have a clear answer in this phase:

- 1- Are the users interested to have such an application like FamilyParking on their smartphones?
- 2- Did the users remember always to push the parking button when they parked their car?
- 3- Did the users remember always that they can check their email to reach the car?
- 4- How many users believe that WhatsApp application is enough to perform that functionality without the need of FamilyParking?

Answering the previous questions in this test was vital to take two important decisions:

- Is it really worthy to invest in such an idea and to implement it?
- If the answer is yes, what are the properties that should be added to FamilyParking that make it preferable to the user comparing with other applications that are in the same domain?

The following testing sheet shows the initial testing results done in this phase:

| Initial testing sheet for the first prototype of FamilyParking application | | |
|--|------------|------------|
| Sample volume: 10 persons. | | |
| Sample age average: 19-25 years. | | |
| Sample community: friends families / Italy | | |
| Test date: Between 1 st Jan / 2015 – 6 th Jan / 2015 | | |
| Questions | Yes | No |
| Is it interesting for the user to download FamilyParking? | 70% | 30% |
| Did the parker remember to push the parking button always? | 40% | 60% |
| Did the car seeker remember to check his email when he want to find the car position? | 50% | 50% |
| How many users thinks that WhatsApp is enough to perform the same functionalities? | 30% | 70% |

2.1.3 The feedback-based plan for the next phase

The plan for the next phase was done according to the last testing results. The following points planned to be considered to go on for the next phase:

- 1- The test showed that 70% of users are interested to have this application on their phones so the idea of FamilyParking is worthy to be implemented.
- 2- The manual configuration for the car position is not enough to solve the user problem because in most cases he could forget to do it. Some solution that could implement some automatic configuration should be implemented in its beta version for the next phase.
- 3- Using the email for reaching the car position by the car seeker is not an effective way to notify the user for the last position of the car. The car seeker should be enrolled as well as the car parker in the same interface.

2.2 Second version

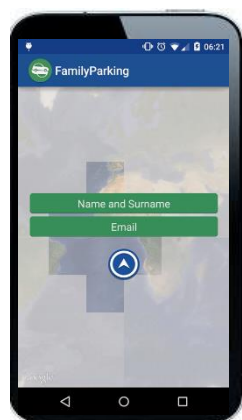
Taking as an input the feedback-based plan of the previous phase, FamilyParking started to be a real application in this phase, not just a prototype that is built for testing goals. The functionality of automatic parking was performed using the Bluetooth technology. The user can add many cars to be shared within the family group. When the user add a new car, he can define the Bluetooth device of that car, so whenever the application detect that device, it will know that an “unparking” operation about to be done, so the “unparking” will be done automatically without the need of user interference. Equivalently, when the application loses the connection with the car Bluetooth device, the application will deduce that there is a “parking” operation about to be done, so the application will do the “parking” automatically without the user interference.

2.2.1 Application overview

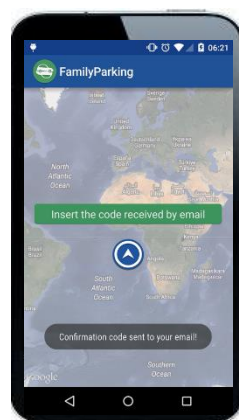
In this version, the following functionalities have been added to the application in addition to those that were existent in the first version:

- **Signing in:**

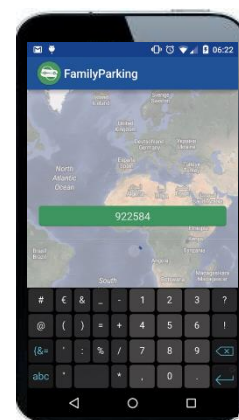
If it is the first time the user opens this application, the user is asked to insert his email **(1)**, then he will receive a confirmation code in his email **(2)**, and by copying this confirmation code to the current application interface **(3)**, the user will be redirected to the main interface and will be authorized to use the full functionalities of the application.



(1)



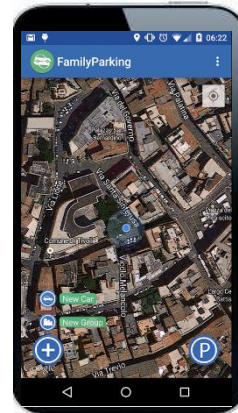
(2)



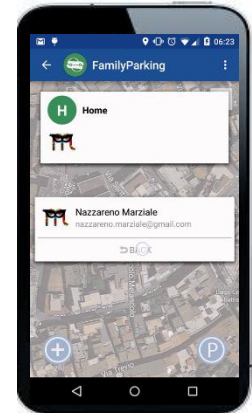
(3)

- **Adding new group:**

In this phase, the user was able to create many groups to share one or more than one car among the group members. When the user wants to create a new group he should **(1)** give a name for that group, and then **(2)** he can add members to that group even from his contacts list or directly by writing the user email.



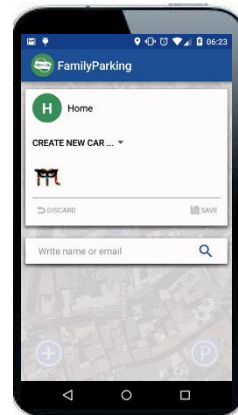
(1)



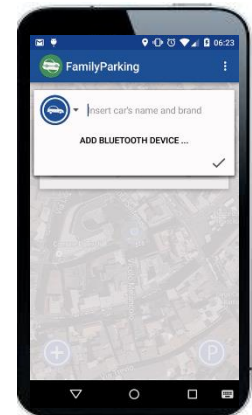
(2)

- **Adding new car:**

As the user can add many groups, he can share many cars within one or more than one group. He can do that when he create a new group or separately. He just needs to **(1)** push on adding new car **(2)** give a name and choose a picture for the new car. Surely while the user is creating the car, he can choose to attach it with a Bluetooth device to support the automatic detection feature.



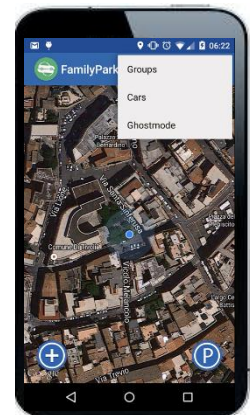
(1)



(2)

- **Enabling/ Disabling the ghost mode :**

For the privacy of the user. Enabling the automatic detection is optional in FamilyParking application. When the user wants to hide his parking information, he can simply disable the ghost mode. In this way the automatic detection of the car parking will be disabled.

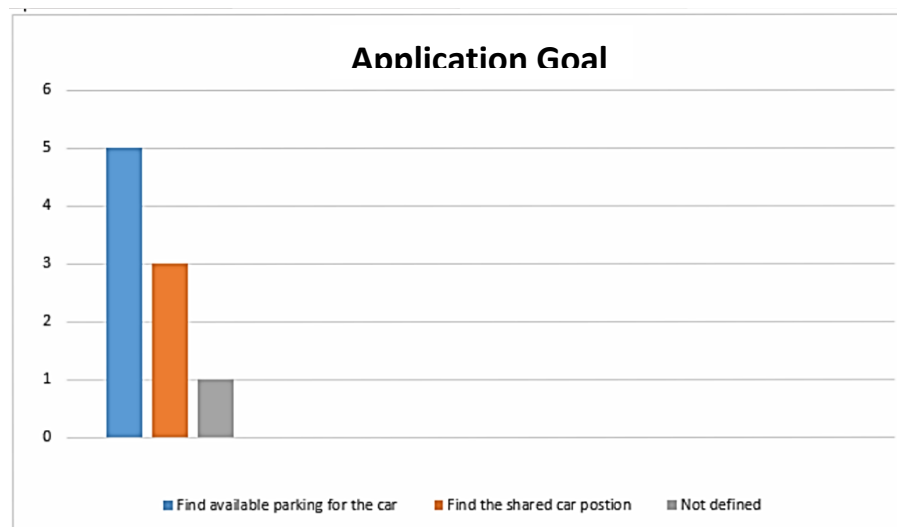


2.2.2 Thinking aloud with users

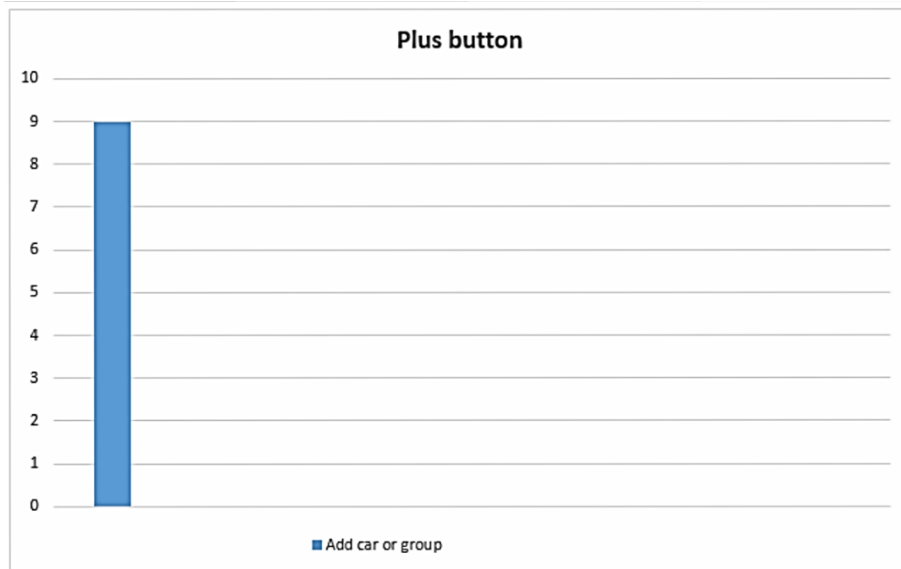
As mentioned before, the application started to be a real application in this phase. That is why, the first real test aimed to be done with users in this phase is the usability test. In other words, the goal was to check how easy is it for the users who knows nothing about FamilyParking to discover the application features alone without any help. To do that, the application was distributed to 9 users, and while they were discovering the application, the following questions have been asked.

- 1- What do you think this application is for?
- 2- After knowing the application domain, what do you think the (+) button is for?
- 3- After knowing the application domain, what do you think the (P) button is for?
- 4- Was it clear for you that there is a support for automatic parking detection in FamilyParking.

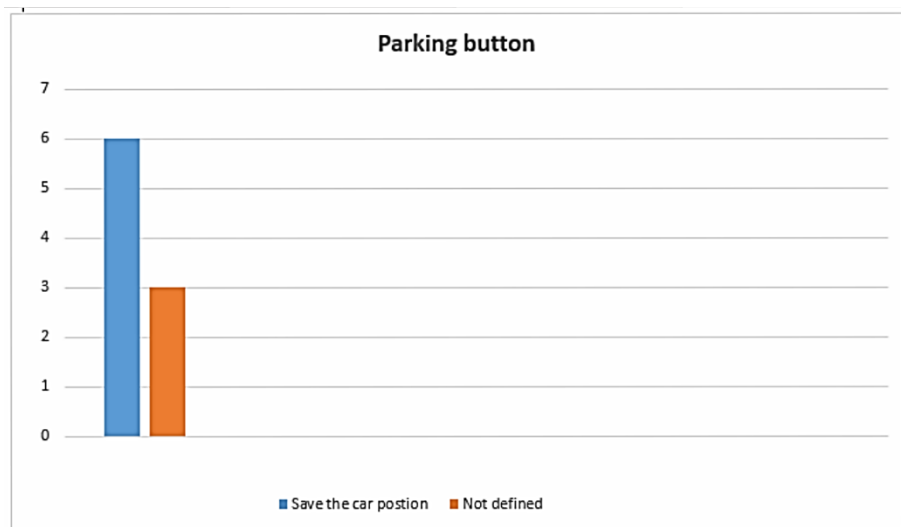
The following figures shows the results of this testing with the users:



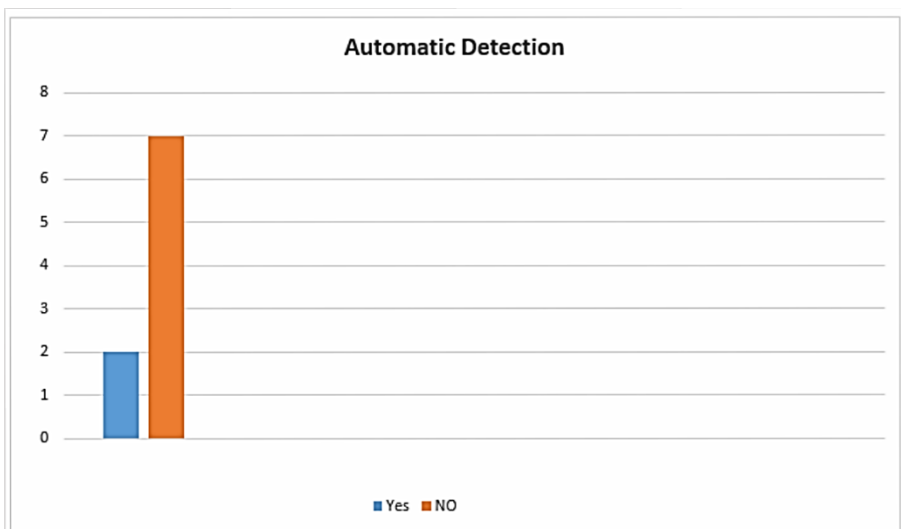
User answers for what they think the application is about



User answers for what they think the (+) button is for.



User answers for what they think the (P) button is for.



User answers about if it is clear the support of Automatic parking

2.2.3 The feedback-based plan for the next phase

The plan for the next phase was done according to the last testing results. The following points planned to be considered to go on for the next phase:

- 1- The test showed that the majority of users thought that the application is for finding a free parking for the car. This could be because the first problem that could come to the user mind when he sees an application containing the word " parking " is the one of finding a parking for the car. Another possibility could be because the designs of the current version of the application containing the logo are not so expressive to give the user the right impression about the Application. For this reason, the designs should be studied again more carefully taking into consideration the multiple types of users.
- 2- Most users have understood well the roles of both (+) and (P) buttons. But putting the two buttons on the same level on the main interface was not a very good choice. The button (P) represents one of the main core functionalities of FamilyParking while adding a new group or car are secondary functionalities that could be added to the settings. Putting both buttons on the same level could give the impression that one button is for parking and another for "unparking".
- 3- Most users didn't know that the application support Automatic parking because the only choice referring to it in the application interface is "Ghost mode". So there should be more focus on promoting Automatic parking detection which is the core functionality of FamilyParking.
- 4- Depending on Bluetooth alone for the automatic parking detection is not enough because still the majority of cars have no embedded Bluetooth device.

2.3 Third version

Taking as an input the feedback-based plan of the previous phase, FamilyParking had a real challenge in this phase to gain the trust of more users. For this reason, the main focus in this phase was on two things. First, improving the designs and interfaces in order to make FamilyParking as usable as possible to the user. Second,

supporting the automatic parking detection with more tools and functionalities in order to make the application more reliable and attractive to gain new users.

2.3.1 Application overview

In this version, the following functionalities have been added to the application in addition to those that were existent in the first version:

- **Automatic parking with using Google API**

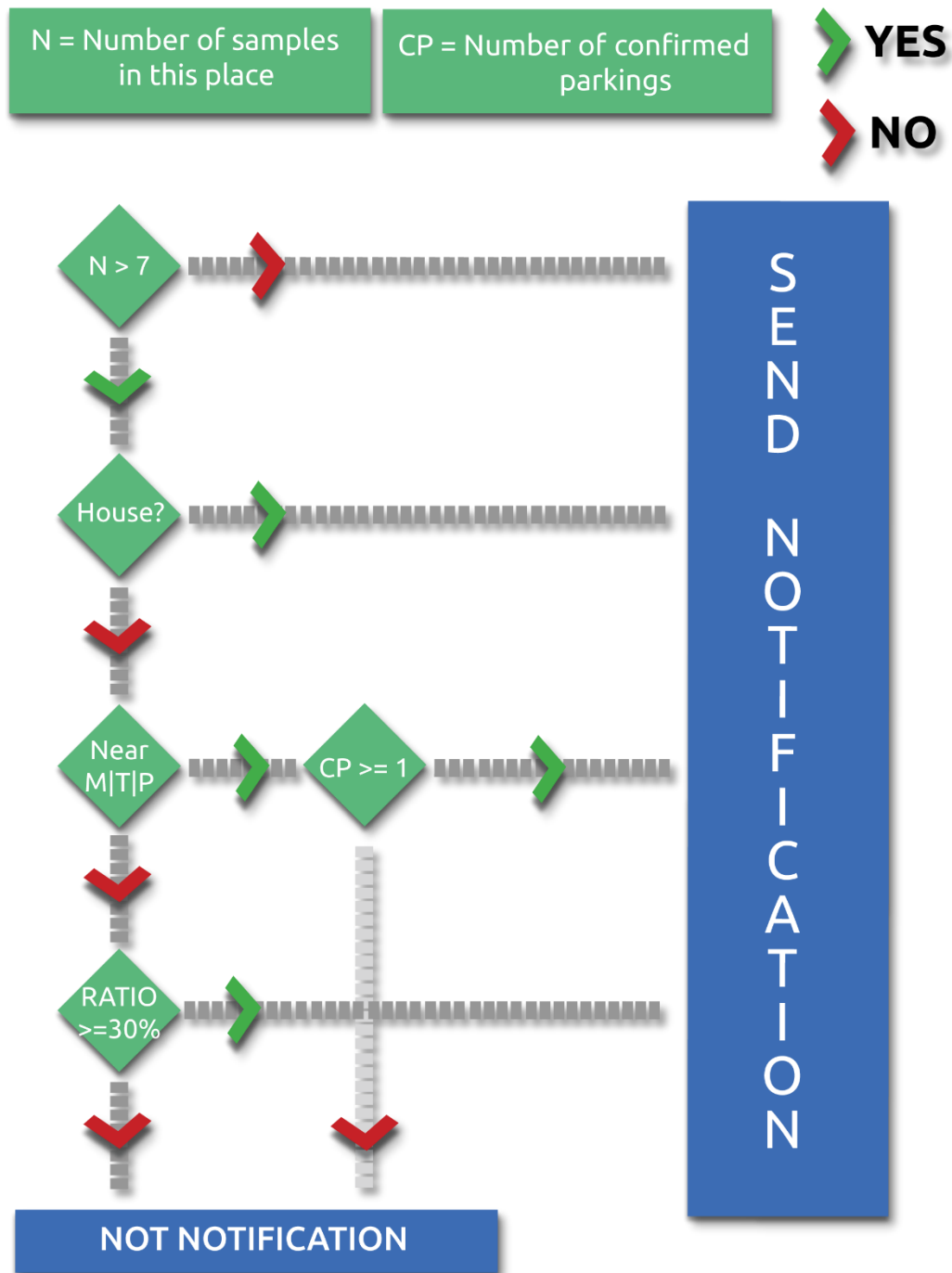
Using Bluetooth alone for the automatic parking is not enough, and also not satisfying for most users either because they don't have embedded Bluetooth in their cars, or because they don't usually leave their smartphone Bluetooth on, so the application will not be able to detect the car Bluetooth device.

Using Google API to support the automatic parking was a good idea, but it cannot be as reliable as Bluetooth for the following reasons:

- 1- The car Bluetooth device for a car could be seen as an identity for the car, so when the application detect that Bluetooth, it 100% means that the user is "Unparking" the shared car. With google API there are no information about the car identity. All what the API can say for the application domain is that the user now is waling, or is in a car. But the user could be taking the bus or the metro.
- 2- Another issue is that Google API take few minutes to start detecting that the user was walking and now he is driving or he is in a car. The same also when he is driving and stop his car and start walking. These few minutes make the decision of "Parking" and "Unparking" on top of Google API inaccurate decision.

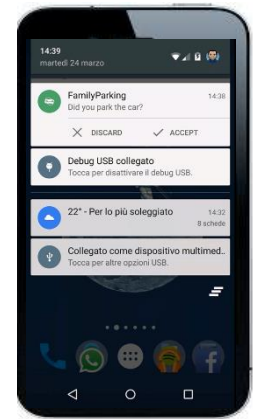
For the reasons mentioned above, no "Parking" or "Unparking" operations can be performed on top of Google API. But a clever notification system could be built. In other words, instead of performing parking/Unparking operations which is not the reliable decision here, a notification could be sent to the user asking for his confirmation whenever the API understand a driving action or a parking action. And to prevent bothering the user with a lot of useless notification, a Heuristic function (called Parky) has been introduced to study the decision of sending a notification to the user or not. This Heuristic function depends mainly on some statistics of the user

behavior. The following is the flow diagram of this heuristic function that is used to decide whether a notification should be sent to the user or not whenever the API understands that there is a parking/ Unparking operations.

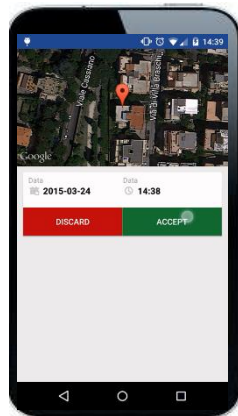


A heuristic function for deciding whether a notification should be sent or not

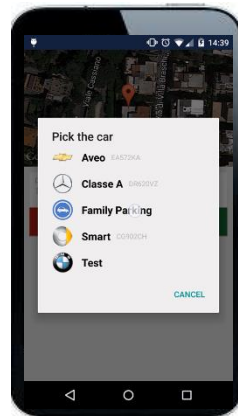
Once the user receives the notification **(1)**, he can confirm it if it was a real parking/Unparking operation **(2)**, and when he wants to confirm, he should surely choose the car **(3)** since Google API has no way to define the identity of the car being used in this operation. In this way the data of this operation on the server will be flagged as confirmed **(4)**, and they will be used for the statistics on the future decision of the Heuristic function of sending the notification. The discarded notifications will be simply discarded from the future statistics.



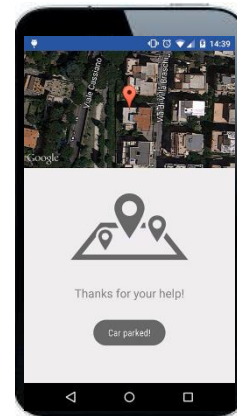
(1)



(2)



(3)



(4)

- **Improving the design to increase the usability**

As was clear in the previous phase feedback that there were some problems related to the usability of the application. In this phase, many changes on the level of designing and laying out the interface have been made to ensure hi level of the usability.

- **Change the strategy of managing groups**

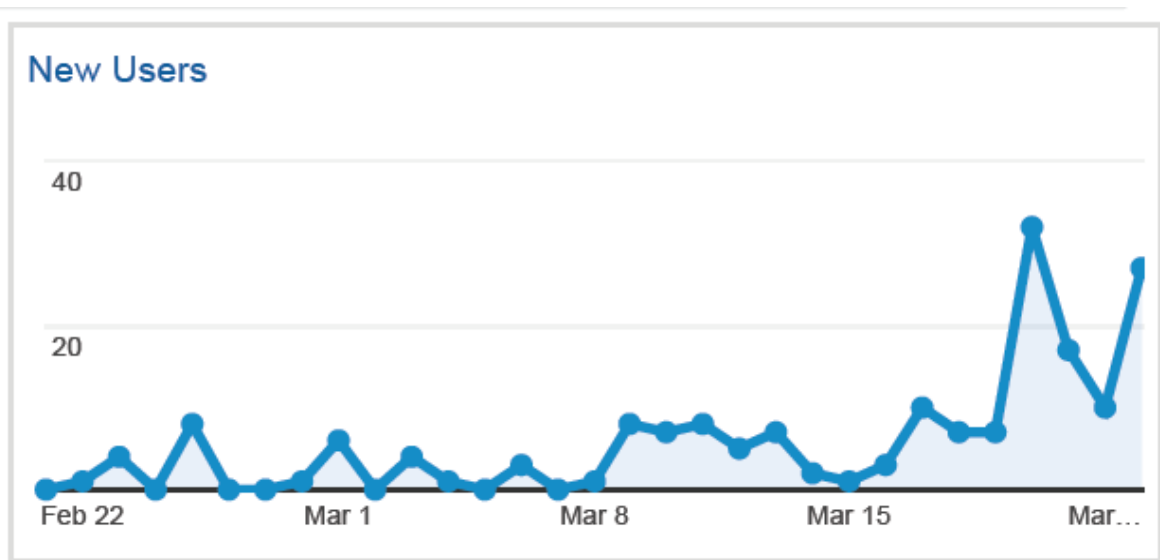
Indeed, creating a group, then creating a car, then connecting groups with cars was a quite problematic strategy for the users to understand the app. To make things easier, the strategy of sharing the car became easier in this stage. No need to create a group. All the user needs to do, is just adding a new car and directly add members to this car with no need to create groups for this aim.

- **Creating an iOS version of FamilyParking**

Since it is quite rare to find a family with the whole members using android systems. Another working version of FamilyParking has been built to work on iPhone devices.

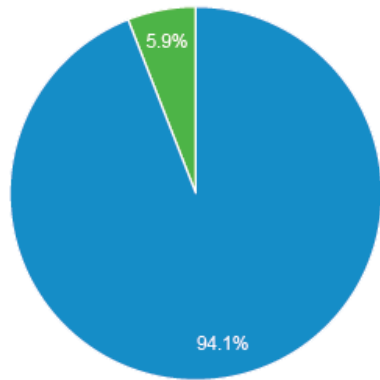
2.3.2 Testing results

As it was planned for, the testing results after this process was promising. The statistics that are automatically calculated on google analytics on the FamilyParking platform has shown that there was a jump in the number of new users in the last period of publishing the application.



Statistics about new users

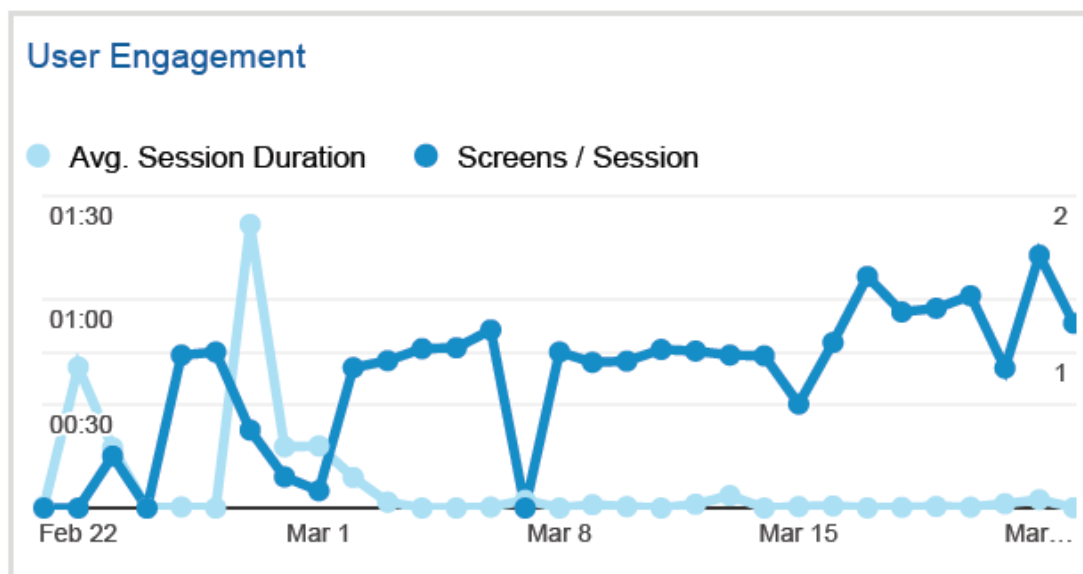
■ Returning Users ■ New Users



And since the number alone is not an enough pointer to show the efficiency of the application. The most important was how many users returned to use the application again after the first time of using. And the statistics has shown a great percentage (more than 90%) which is a good pointer.

Statistics about new returning users

Another important pointer to prove the usability of the application. The following figure shows the improvement by the time of the session duration average each user spends (the light blue line). It is clear that it is reduced to 0 after the last version of the app. The figure also shows that the number of screens per session that needed for the user to reach their goals (the dark blue line) was fluctuating between 2 and 1.



User engagement

3.1 Downloading FamilyParking application

Downloading FamilyParking is very easy since it is now published on both Google Play Store and Apple Store. To download the app, you can do the following:

- 1- Go to FamilyParking website ^[5]
- 2- If your mobile system is iOS, simply click on “Download on App Store”, and if your mobile system is Android, click on “Download on Google Play Story”.



FamilyParking website main page

3.2 Opening the application for the first time

If this is your first time to open the application on your smartphone, you need to perform a signing in before you are able to use the application. Note that the signing in operation happens only once and you don't need to perform it any more after your first time. To sign in successfully do the following:

- 1- Click on the application icon on your phone.
- 2- Provide your name and your email in the specified fields respectively then click on the activation button.
- 3- After few seconds, you will receive an activation code on your email specified in the email filed before. Type this code in the specified field in the current interface then click on the activation button again.
- 4- If the code is correct, you will be redirected to the interface of creating new car and you are now ready to use the application successfully*.

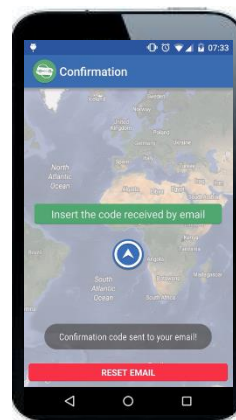
***Note:** In case you didn't receive any code with the email specified in the first step. You can click on "Reset email "button, and retype your email or user another email.



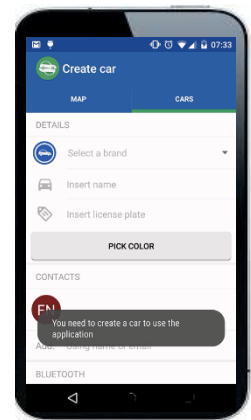
(1)



(2)



(3)



(4)

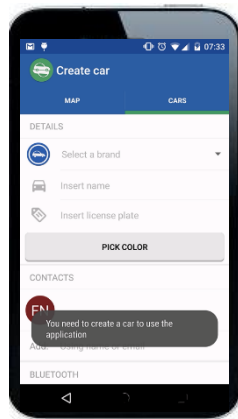
3.3 Managing groups

3.3.1 Adding new car and sharing it

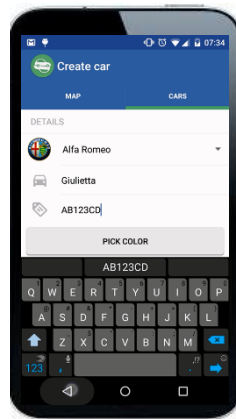
1. If you are not already on the "Cars" interface, click on the cars tab.
2. Define the brand of the car, the name, and license plate.
3. Choose a color for the flag the will be used for this car on the map when it will be parked.
4. To share this car with some members, add members under the label "contacts". You choose members from your contact list, or you can address the people who are not in your contact list by their email*.

5. Click on save to save the information of the car.

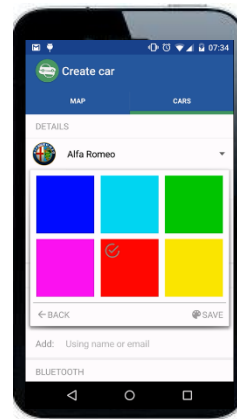
***Note:** You can also attach a Bluetooth device with the car in this step. If you want to add the Bluetooth device in this step, read the manual starting from the point 3 in the part 3.3.2.



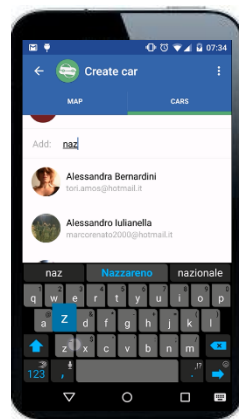
(1)



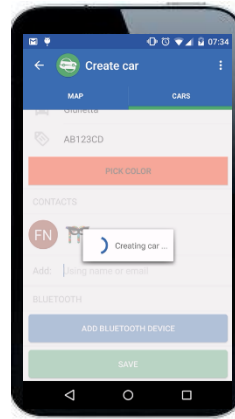
(2)



(3)



(4)

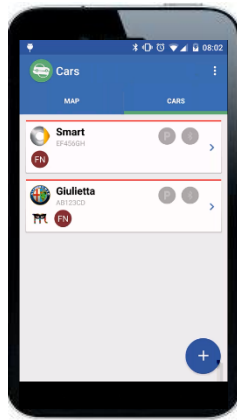


(5)

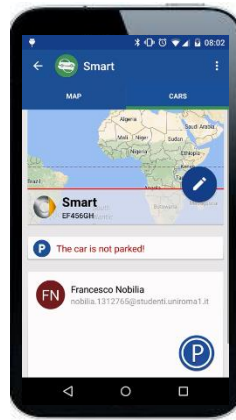
3.3.2 Attaching the car with a Bluetooth device

1. If you are not already in the “Cars” interface, click on the tab “Cars”.
2. Choose the car you want to attach a Bluetooth device with it and click on Edit.
3. Click on “Add Bluetooth Device”.
4. Choose the Bluetooth device from the list detected by your smartphone.

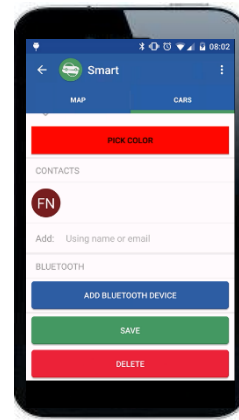
5. Save the information.



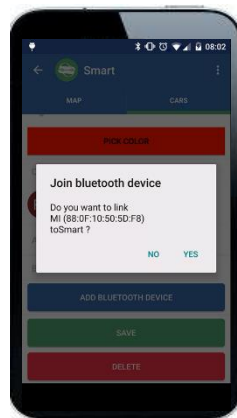
(1)



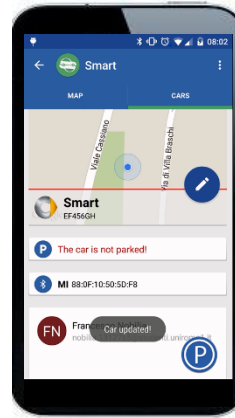
(2)



(3)



(4)



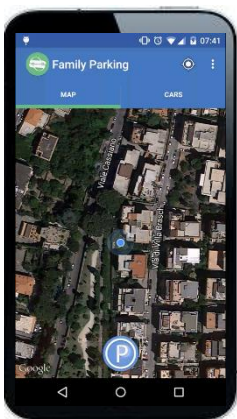
(5)

3.4 Manual parking and unparking

3.4.1 Parking

- 1- If you are not already in the “Maps” interface, click on the “Maps” tab.
- 2- To do parking, click on the (P) button.
- 3- An interface will appear for you to choose the car you want to park*.
- 4- Once you choose the car, parking will be done and a flag will be added to the map.

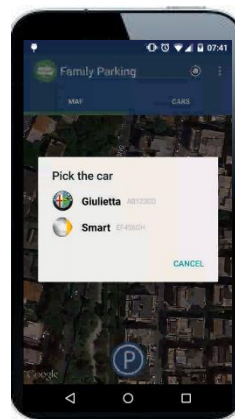
***Note:** in case you have just one car in your cars list. This interface will not appear the parking will be done by default to the car you have.



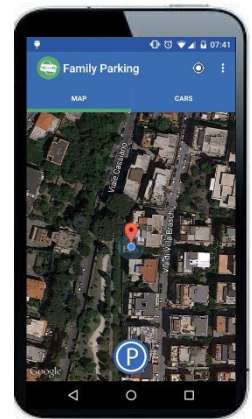
(1)



(2)



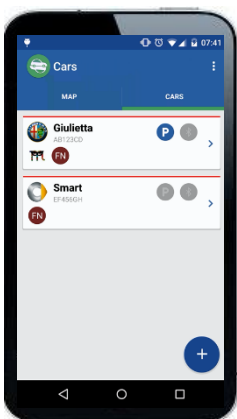
(3)



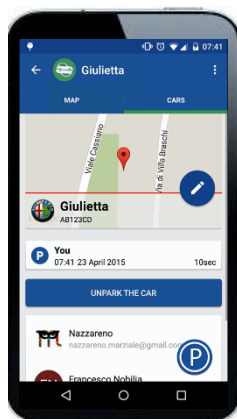
(4)

3.4.2 UnParking

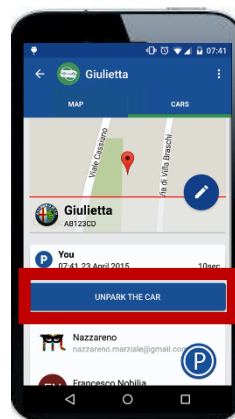
- 1- If you are not already on the “Cars” interface, click on the “Cars” tab.
- 2- Choose the car you want to Unpark.
- 3- Click on the button “Unpark the car”
- 4- Car will be removed from the Map.



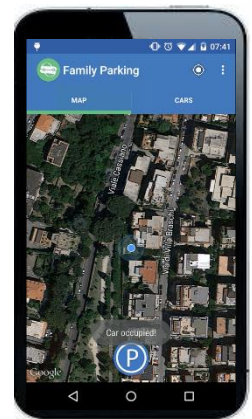
(1)



(2)



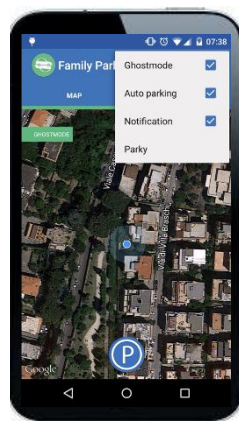
(3)



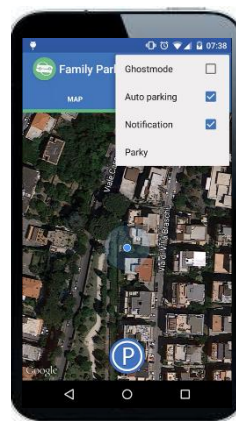
(4)

3.5 Enabling/ Disabling ghost mode

If you want your activities of parking and unparking to be undetectable/detectable, you can enable/ disable the Ghostmode choice*.



(1)



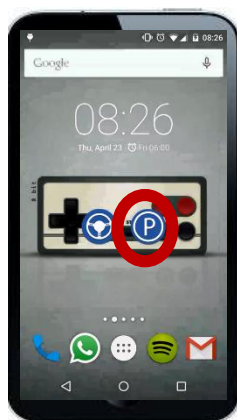
(2)

***Note:** in case you deactivate the “Ghostmode” and you want your activities to be detectable by both Bluetooth, and Google API, you should activate “Auto Parking” and “Notifications” respectively.

3.6 Using the Widget

3.6.1 Parking

- 1- Click on the (P) button.
- 2- An interface to choose the car will appear*.
- 3- Once the car is chosen, the parking will be done.



(1)



(2)

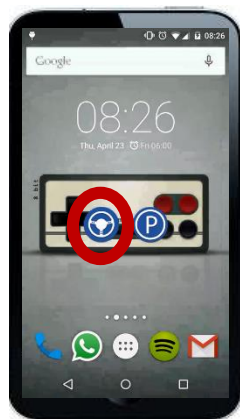


(3)

***Note:** in case you have just one car in your cars list. This interface will not appear the parking will be done by default to the car you have.

3.6.2 Unparking

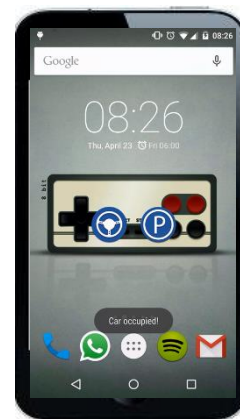
- 1 Click on the (Unparking) button.
- 2 An interface to choose the car will appear**.
- 3 Once the car is chosen, the unparking will be done.



(1)



(2)



(3)

****Note:** in case you have just one car in your cars list. This interface will not appear the parking will be done by default to the car you have.

References:

- [1] Wikipedia, “WhatsApp”, Last modified [17 Jan 2015], Accessed [18 Jan 2015] <http://en.wikipedia.org/wiki/WhatsApp>
- [2] Wikipedia, “Rome”, Last modified [29 Jan 2015], Accessed [2 Feb 2015] <http://en.wikipedia.org/wiki/Rome>
- [3] Android Developers, “Dashboards”, Last modified [5 Jan 2015], Accessed [2 Feb 2015] <https://developer.android.com/about/dashboards/index.html>
- [4] Unity3d, “MOBILE (IOS) HARDWARE STATS”, Last modified [Dec 2014], Accessed [2 Feb 2015] <http://stats.unity3d.com/mobile/os-ios.html>
- [5] FamilyParking Website, Last modified [March 2014], Accessed [25 April 2015] <http://www.familyparking.it/index.html>