



My Car Locator

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The challenge

- Help our employees find their cars in the parking lot.
- We have over 15,000 employees and all of their cars in our main campus. Employees have been “losing” their cars in the lot. They forget which of the 5 giant parking lots they parked in and are wandering around clicking their door alarms in order to find their cars. The noise pollution at the end of the day is terrible.
- We already have a company app. We want to add a feature that will help employees find their cars.

Consider:

- Couples often swap cars when driving to work. What if the employee has more than one car s/he drives to work?
- This feature should be prominent on the app—but the home screen is already full. How will you make it fit without removing something?

Understanding the problem

Goal: Design a feature for the company's mobile application, with which the users are able to find their cars in the in-campus parking lots.

Considerations:

Couples often swap cars when driving to work. What if the employee has more than one car s/he drives to work? - **The feature should be independent of the car the user is driving.**

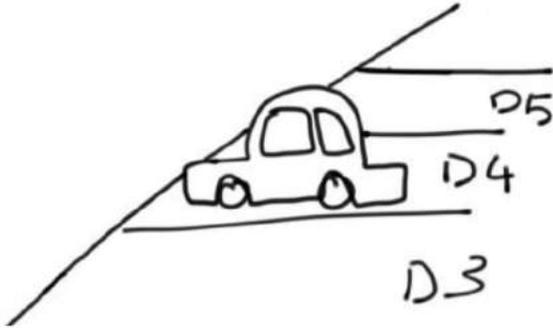
This feature should be prominent on the app, but the home screen is already full. - **Without using the real estate of the application dashboard, the feature should still be easily accessible when required.**

Breaking the problem down

I identified that the parking information is needed by the user at two instances:

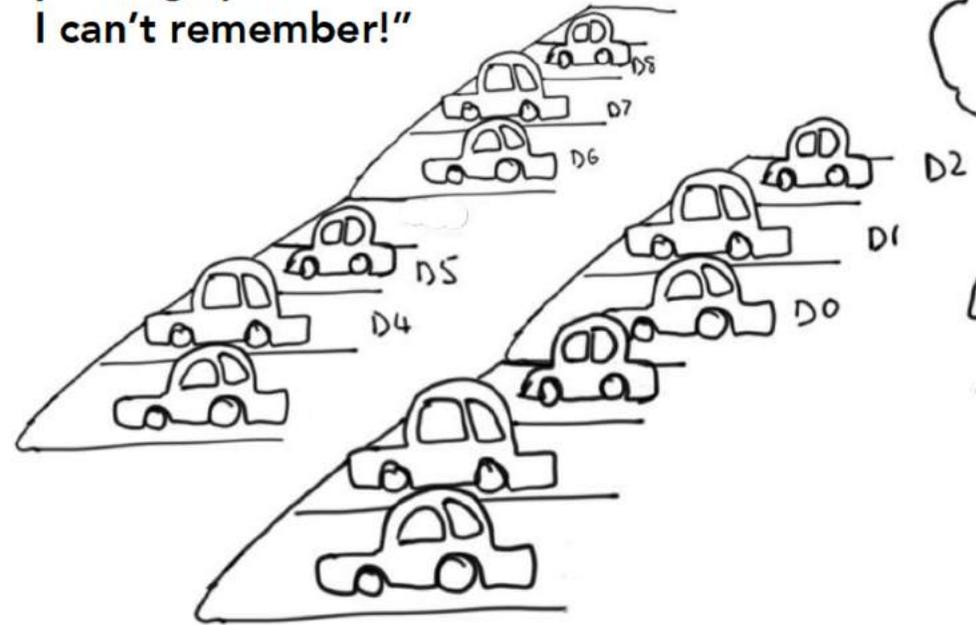
While parking the car:

**"I have to remember
The parking
location."**



While looking for the car:

**"What as the
parking spot?
I can't remember!"**



With a better grasp of the problem, I got started with the research process to understand the users and current solutions.

Research

Guerrilla User Research:

I performed three quick interviews with people who drive cars and use public parking facilities. Asking them questions like, *"What is a normal parking experience for you?"* and, *"Have you ever been lost your car in a parking?"* helped me understand their needs and behaviors.



"I always buy parking tickets on the phone, as it is easy and way quicker... I want to spend minimum time dealing with parking."



"I tried using Google Now to help me find my parking spots, but it is not always accurate and some times does not work. "



"Parking lots are confusing because everything looks so similar, specially in the big ones...even the signages do not help."

Side Note:

A bigger sample size and interview with actual users (company employees) would give more concrete insights.

Research

User Research Insights:

Some of the common answers lead to the following insights which I have divided according to the use cases:

While parking:

- Users want to be done with the parking procedure **quickly**.
- They try to avoid big parking lots because it takes time overall.

While looking for their car:

- Looking for car in big lots is difficult at peak times due to **less visibility**.
- Parking ticket do **not** give them **enough information to find the exact location**.
- **Signages do not help** that much.
- Users use the honking feature a lot, because it is **accurate and precise**.

Experience mapping

I mapped the user experience of the users based on the interviews into AEIOU Framework:
(activities, environment, interactions, objects, user)

Parking:

| | Activities | Environment | Interactions | Objects | User |
|------------|----------------------|------------------|---|--|-------------------|
| Enter | Drive through gate ● | Parking entrance | with cars | Car | Driver (Employee) |
| Park | Park the car | Parking Spot | Drive according to the spot and environment | - own car - other's parked cars - infrastructure | Driver (Employee) |
| Buy ticket | Get down the car ● | Parking Lot | operating the mobile app / ticket kiosk | mobile device / ticket vending kiosk ● | Driver (Employee) |

Finding the car:

| | Activities | Environment | Interactions | Objects | User |
|----------|------------------------------|-------------|--|--|-------------------|
| Enter | Enter the parking lot ● | Entrance | — | — | Driver (Employee) |
| Find Car | Look for your parking spot ● | Parking Lot | Read Signages, use phone to navigate, use car remote to honk |   | Driver (Employee) |
| Drive | Exit the lot ● | " | driving the car |  | Driver (Employee) |

This helped me to identify the points when the MCR (My Car Locator) can be used to record and deliver the information.

● Record Information

● Deliver Information

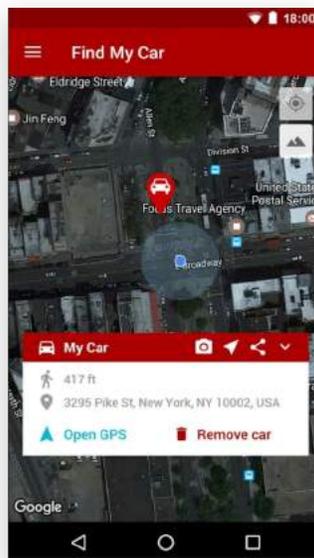
Research

Competitive Analysis:

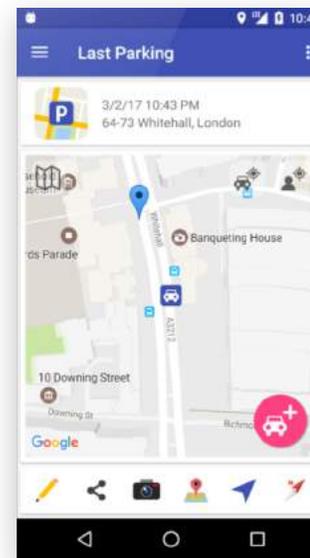
I researched the current available solutions to save and find parking spots. The solutions ranged from standalone applications to integrated feature in Google Now.



Google Now



Find My Car
(Android)



Parking Reminder
(Android)

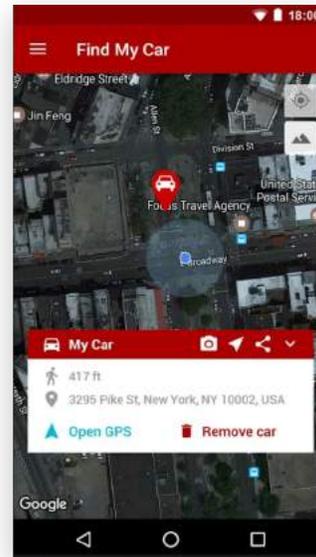
Research

Competitive Analysis Insights:

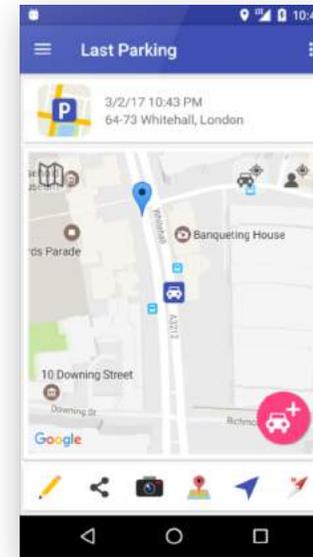
While all the options were easy to use and well made, they all required some input by the user (except google) and suffered with inaccuracy.



+ve: Automatic
-ve: inaccurate/non-functional at times.



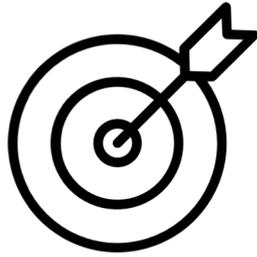
+ve: Easy to use
-ve: inaccurate at multiple times.



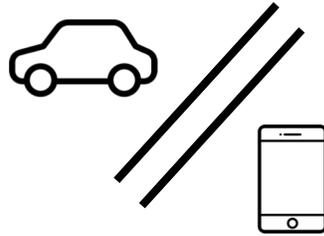
+ve: Many features
-ve: inaccurate at multiple times.

Based on the initial considerations and assumptions as well as insights from the research, I developed the following design principles and started brainstorming to come up with ideas for the MCL feature.

Design principles:



The parking location recorded should be accurate.



Feature should be independent of the vehicle.

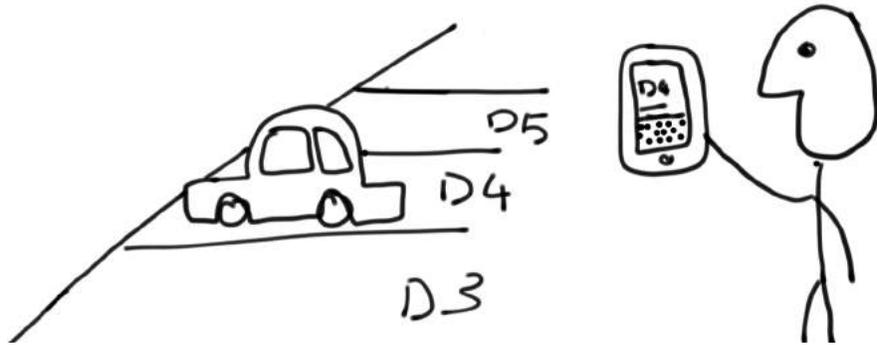


Feature should not use any space on the home screen of the company application.

Solving two problems

I identified that the MCL feature will be used in two major instances:

While parking the car –
Parking information to be recorded.

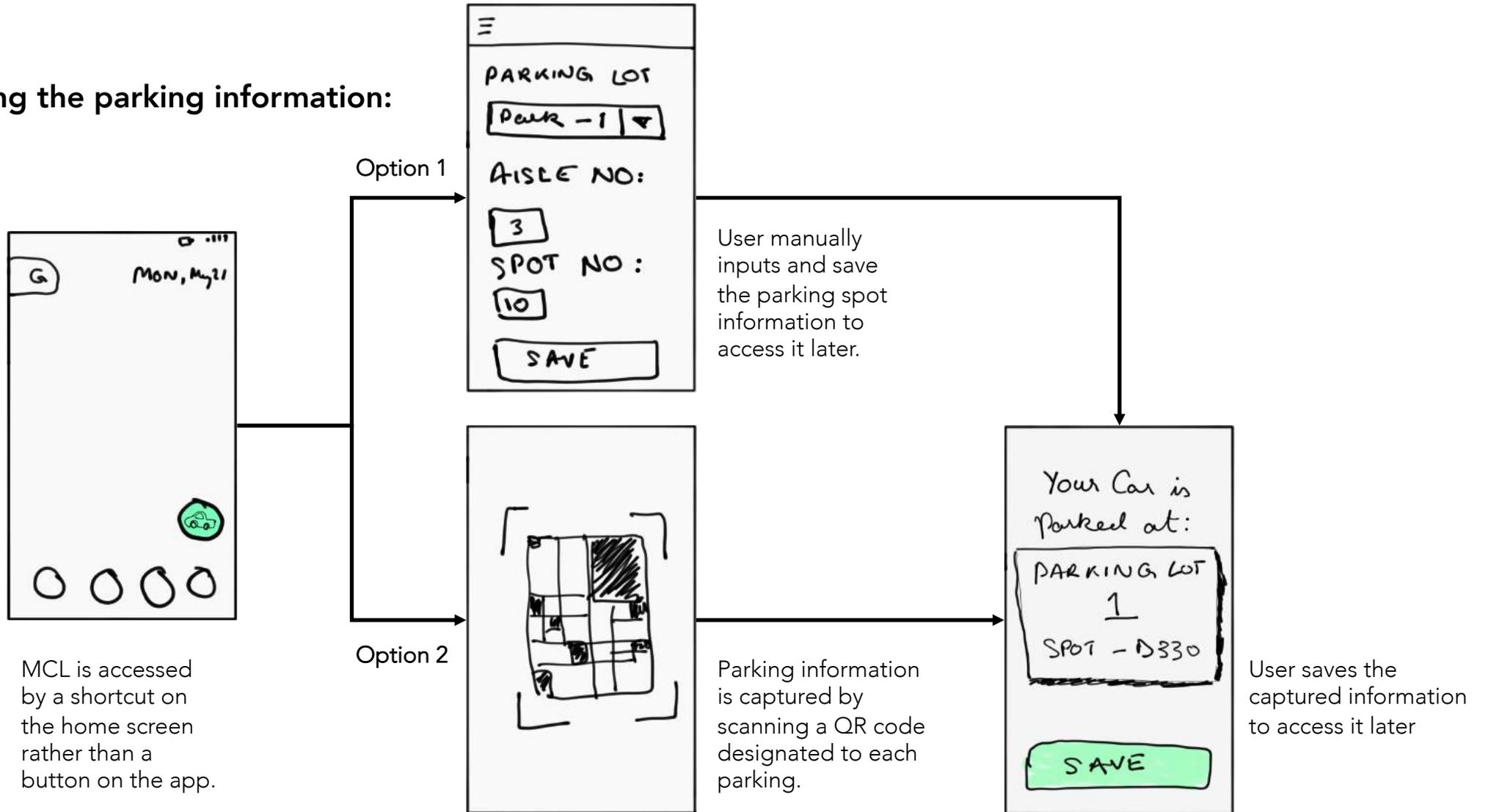


While looking for the car –
Parking information to be retrieved/delivered to the user.



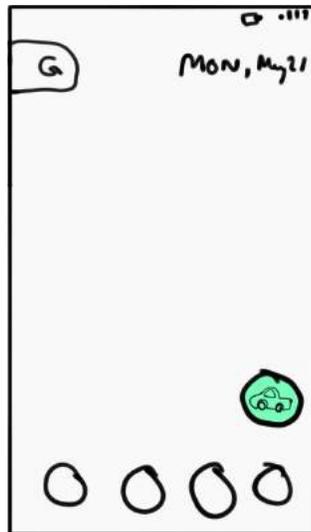
Ideation

1) For recording the parking information:



Ideation

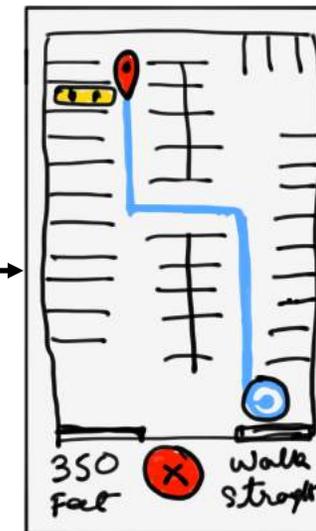
2) For finding the car in the lot:



MCL is accessed by a shortcut on the home screen rather than a button on the company app.



User is displayed with the parking information that was saved earlier. He has an option to navigate to the spot or discard the saved information.



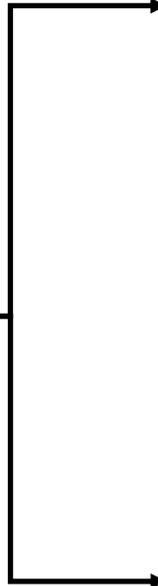
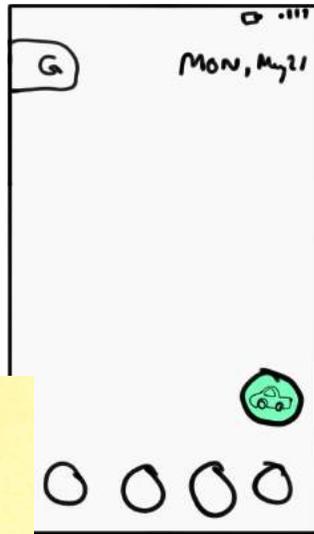
Map of the parking lot is displayed on the screen when user chooses to navigate, with distance and walking directions.

I took my initial ideas to the users I had interviewed to get some quick feedback.

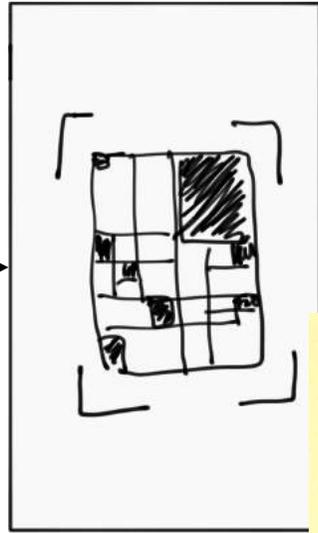
User Feedback

1) For recording the parking information:

"I don't like another icon on my phone screen for the same application"



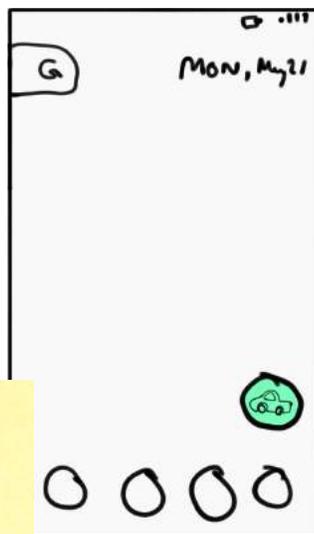
"Manually feeding the information takes too much time"



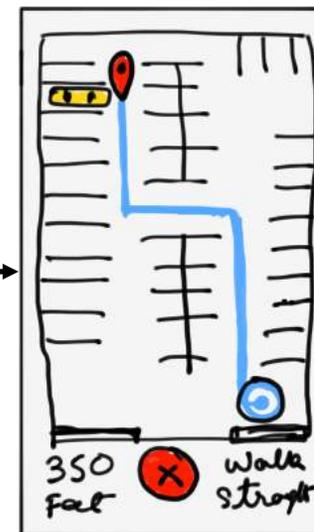
"This idea is better, but it is yet another task to perform"

Ideation

2) For finding the car in the lot:



"I don't like another icon on my phone screen for the same application"

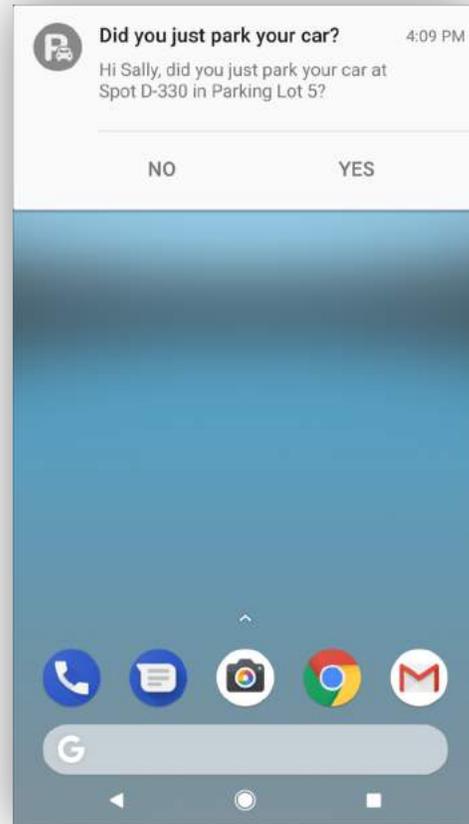


"Possibility of navigation in the parking lot is a great idea"

Based on the feedback, I further refined the design and the features and created high fidelity mockups.

Design finalization:

1) For recording the parking information:



When the user enters a parking lot, the application uses location services to identify the lot and sends a notification to the phone asking if the user parked his car at a particular spot. The only call to action for the user is to click on yes or no button.

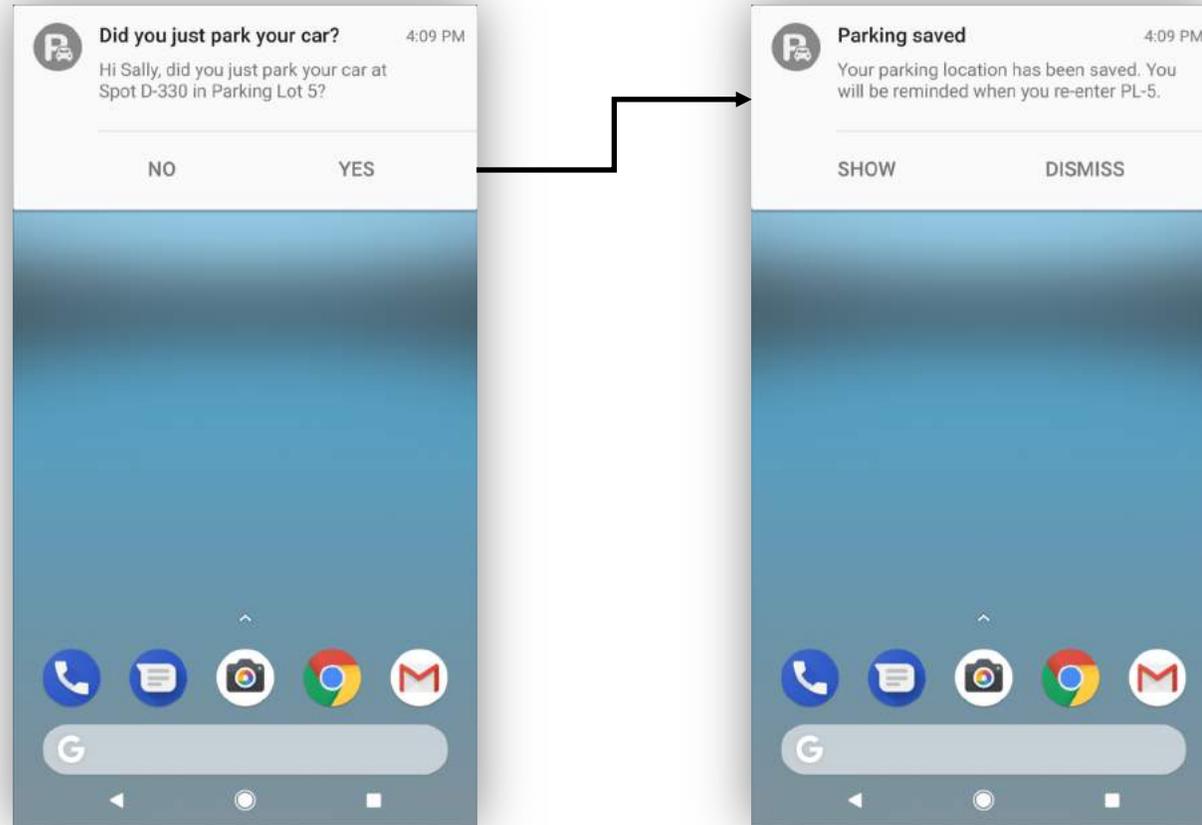
No access to the application required.

Quick call to action.

Accurate and precise location capture.

Design finalization:

1) For recording the parking information:

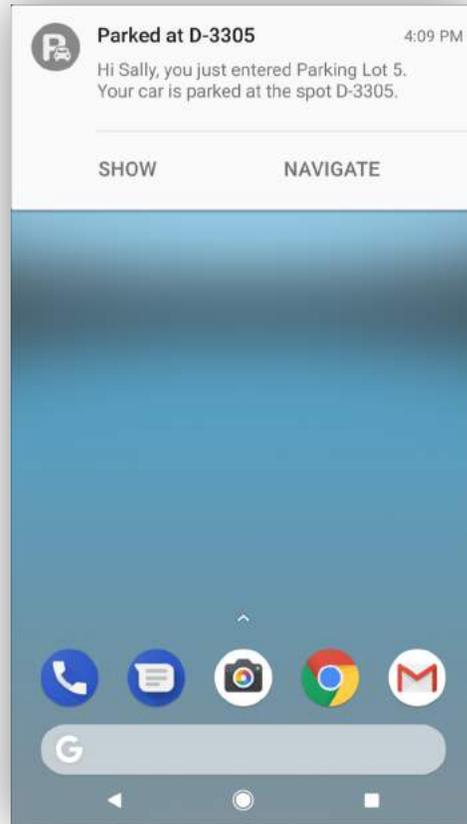


Clicking on "YES" option confirms that the parking location has been saved, using another notification.

User has option to "DISMISS" the notification or to "SHOW" the saved information by opening up the application.

Design finalization:

2) For finding the car in the lot:



When the user enters the parking lot again, he gets a notification informing them about their parking spot.

The notification also gives the option to "SHOW" the information on the app or directly "NAVIGATE".

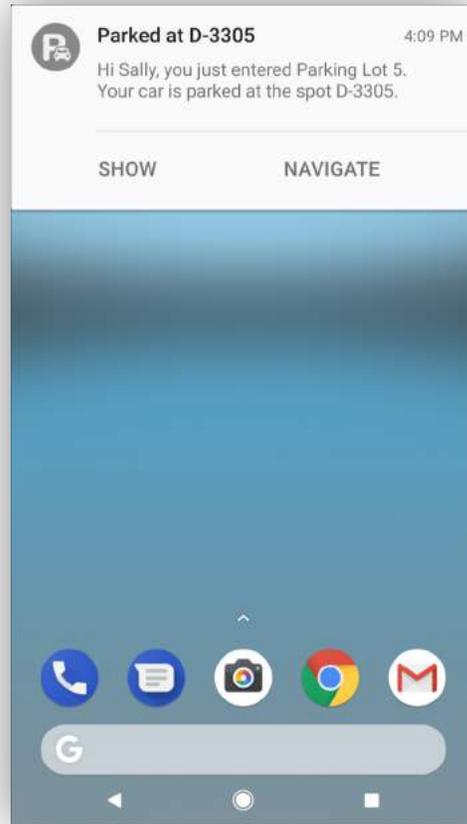
No access to the application required to get the information.

Quick call to action.

Accurate navigation and precise directions.

Design finalization:

2) For finding the car in the lot:



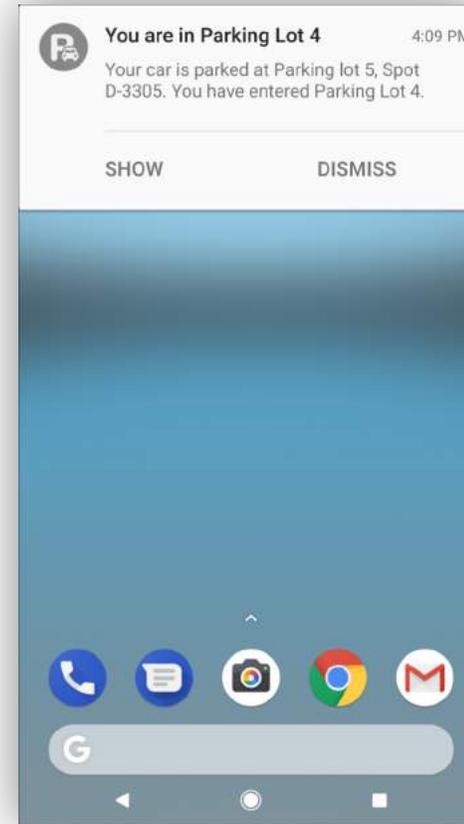
When the user enters the parking lot again, he gets a notification informing them about their parking spot.

The notification also gives the option to "SHOW" the information on the app or directly "NAVIGATE".

No access to the application required to get the information.

Quick call to action.

Accurate navigation and precise directions.

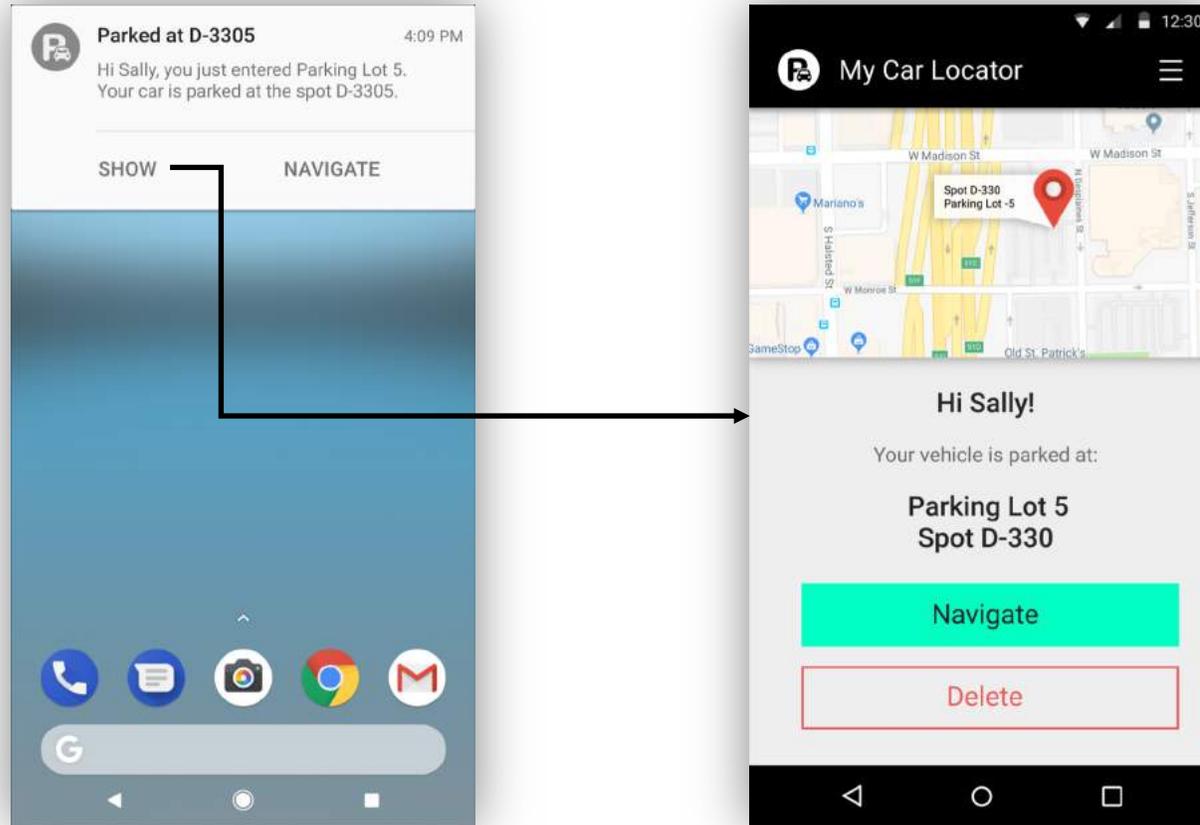


If the user enters any other Parking Lot than where he has parked his vehicle originally, he gets a notification that reminds him of his original parking spot.

The user can then see the original spot by clicking on "SHOW", or just "DISMISS" the notification.

Design finalization:

2) For finding the car in the lot:

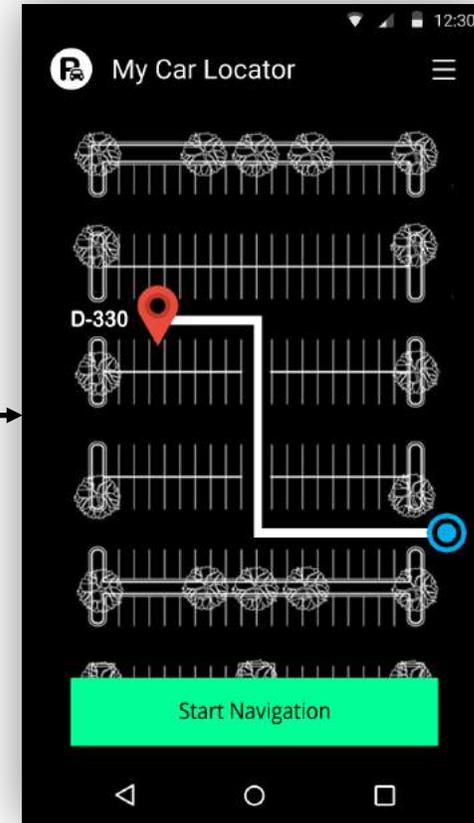
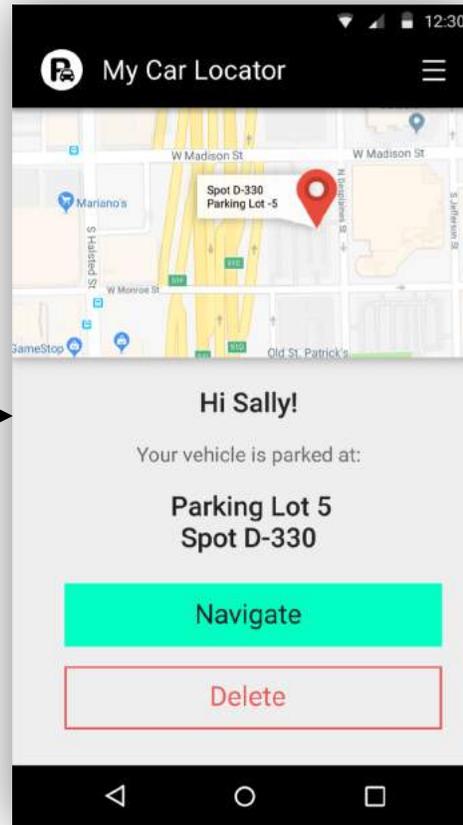
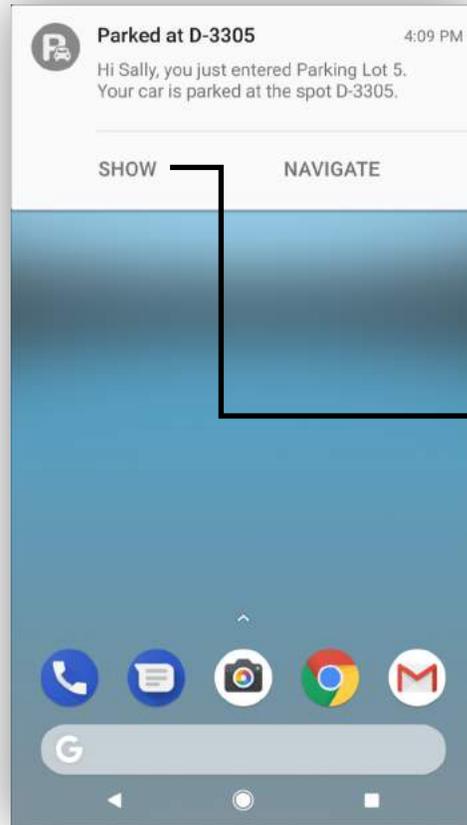


When the user clicks on "SHOW" in the heads-up notification, the application opens and the parking location is displayed on a map, as well as the exact address is also displayed.

The user has the option to "Navigate" to the spot or "Delete" the saved location.

Design finalization:

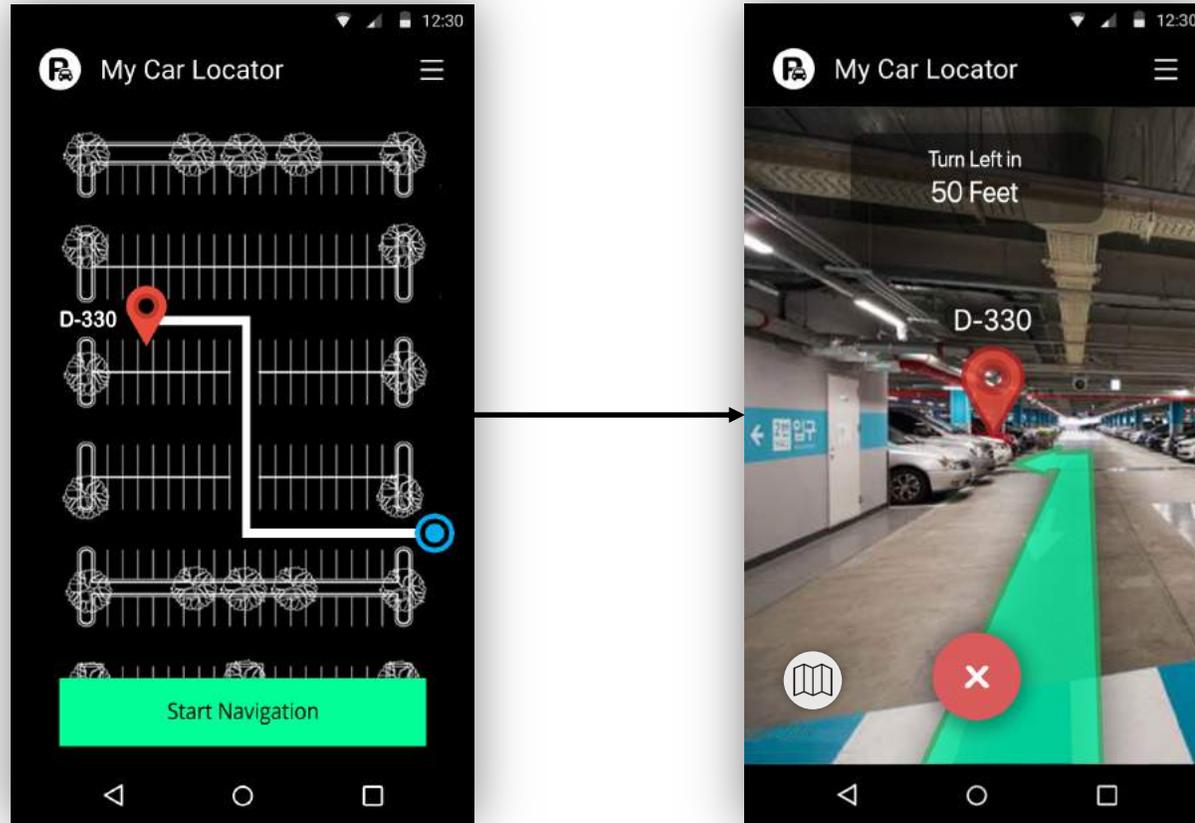
2) For finding the car in the lot:



Clicking on Navigate will show users the overhead map/plan of the parking lot, depicting user's and the parking locations.

Design finalization:

2) For finding the car in the lot:

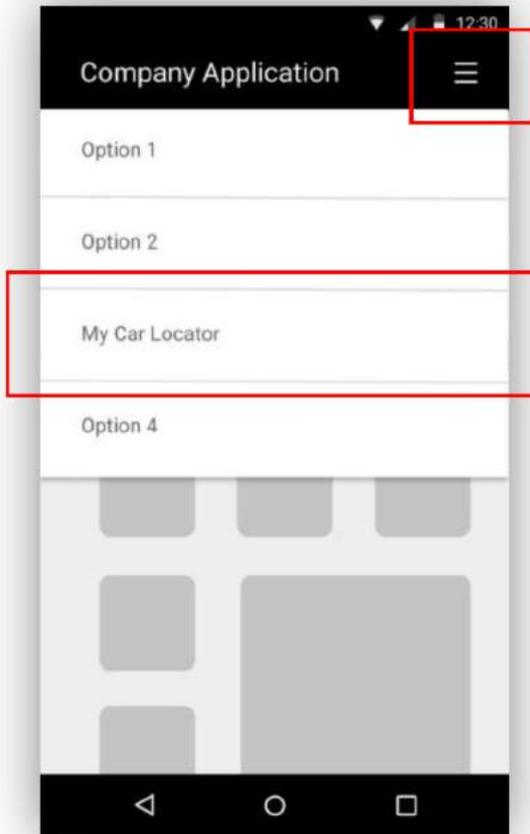


When the "Start Navigation" is clicked, User is helped with turn by turn precise navigation directions, augmented over the real world on the screen using AR technology.

User can cancel the navigation anytime or change back to the map view.

Design finalization:

For accessing the parking information when not in the parking lot:



User can also access the parking information from the navigation drawer of the company application.

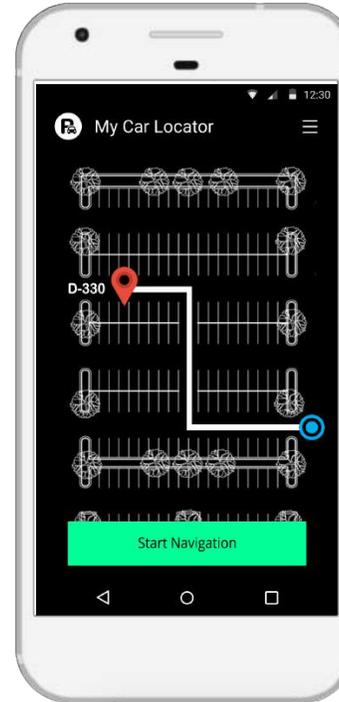
Suggested technologies for implementation

For triangulating the location of the user:



The application sends MCL related notification when it detects that the user is inside the parking lot. Following technology are suggested to determine the location of the user.

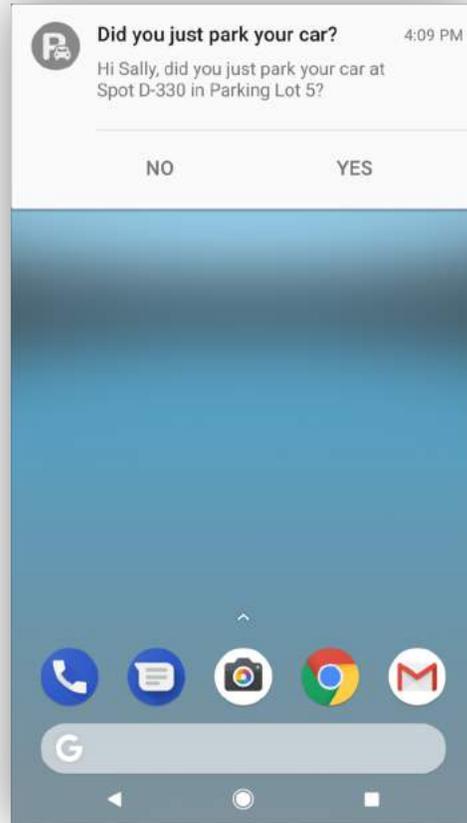
- To determine the Parking Lot where the vehicle/user enters:
GPS Information
- For navigation inside the parking lot: **Beacons**



Assumption:
Parking lot in the campus belong to the company exclusively. Any modification or addition assisting the application's feature may be implemented in the infrastructure.

Improvement

For recording the parking information:



When the user enters a parking lot, the application uses location services to identify the lot and sends a notification to the phone asking if the user parked his car at a particular spot. The only call to action for the user is to click on yes or no button.

No access to the application required.

Quick call to action.

Accurate and precise location capture.

If the user does not take any action, the parking spot is automatically saved.

If the user dismisses the notification without taking any action, the parking information is discarded.

Thank You

-Harsh Wardhan