

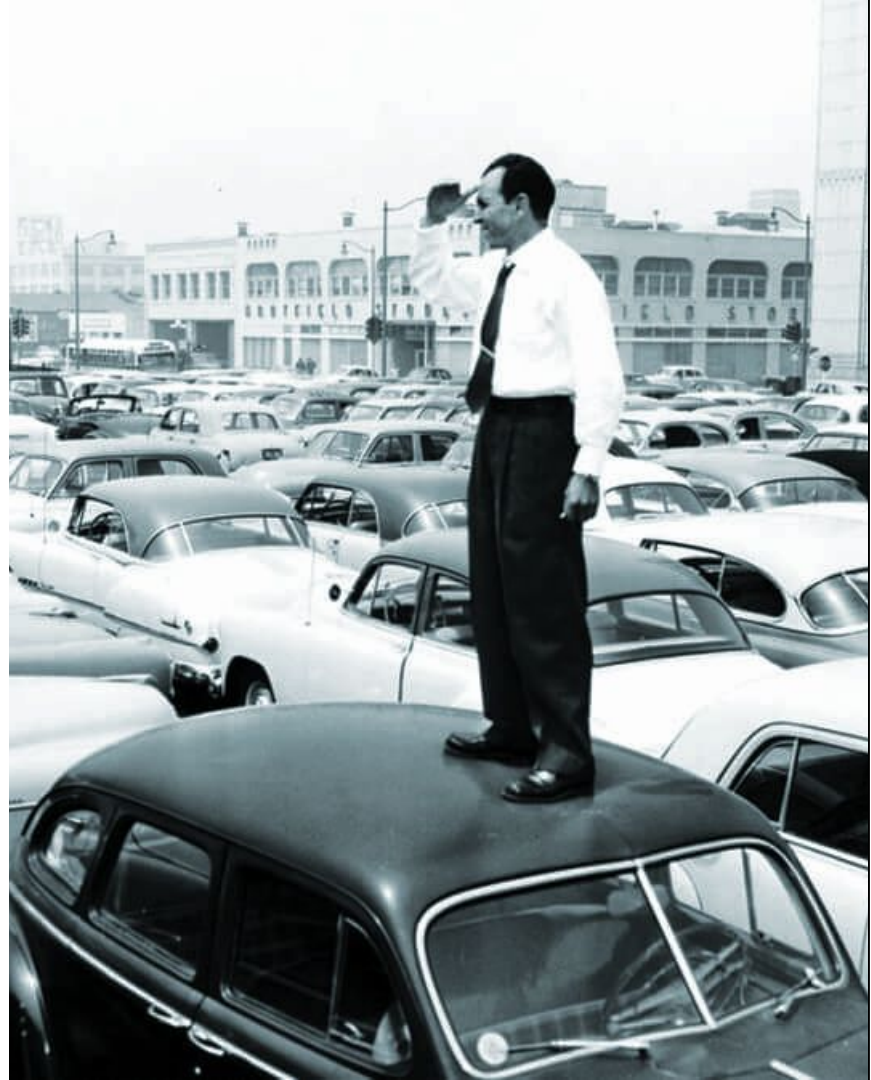
My Car Locator

Introduction & Background

Smart technologies have transformed parking management, particularly in large corporate campuses and urban centers. As workforces grow, **efficiently managing parking spaces and helping employees locate their vehicles has become challenging.**

Car manufacturers have integrated GPS systems and smartphone connectivity to assist in vehicle location. However, these solutions can be unreliable in large sized parking structures. Third-party apps often require manual input, leading to inconsistent usage and inaccuracies.

Corporate campuses face unique challenges with thousands of employees and shared vehicles. Traditional parking management systems struggle to keep pace.



The Challenge

The client faces a significant challenge with their large corporate campus, which houses over **15,000 employees and their vehicles**.

The main issue is that **employees frequently struggle to locate their cars among the five giant parking lots on the campus**.

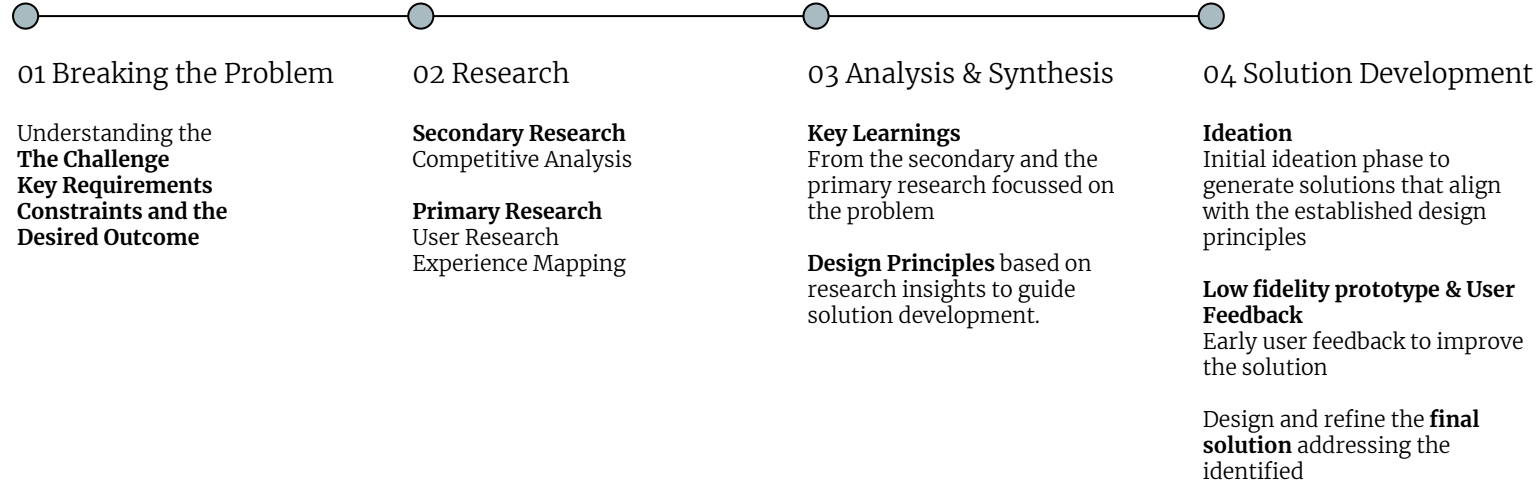
This problem leads to a frustrating and time-consuming experience at the end of the workday, as employees wander around clicking their car door alarms in an attempt to find their vehicles. The resulting noise pollution has also become a major concern.

To address this issue, **the client wants to enhance their existing company app by adding a new feature that will assist employees in efficiently locating their parked cars**.

This solution should help streamline the process of finding vehicles, reduce the time spent searching, and mitigate the noise pollution caused by excessive use of car alarms.



Design Process



Breaking down the problem

The Challenge

The client presented the problem below:

1. Over 15,000 employees **struggle to locate their vehicles** in five giant parking lots
2. Employees resort to using car alarms, causing significant **noise pollution** at day's end
3. A solution is needed **within the existing company app**

Key Requirements

1. **Vehicle Location:** Develop a feature to help employees easily find their parked cars
2. **Multi-Car Compatibility:** Accommodate employees who drive different vehicles on different days
3. **App Integration:** Incorporate the feature prominently without removing existing elements

Constraints

1. **Space Limitation:** The app's home screen is already at capacity
2. **User Experience:** The solution must be intuitive and easily accessible
3. **Versatility:** The feature should work regardless of the specific car being driven

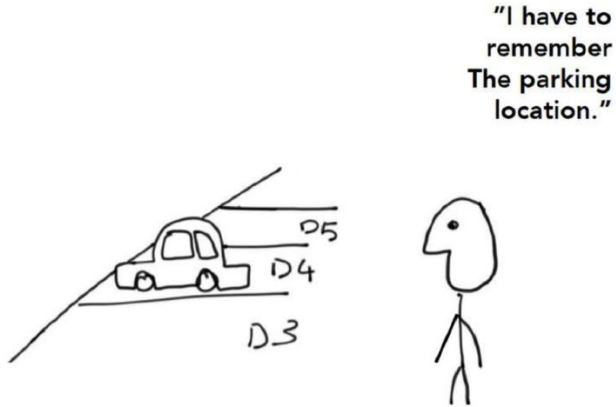
Desired Outcome

- A seamless, user-friendly solution that:
1. **Reduces time spent** searching for parked vehicles
 2. **Minimizes noise pollution** from car alarms
 3. **Integrates** smoothly with the existing company app
 4. **Adapts** to employees' varying car usage patterns

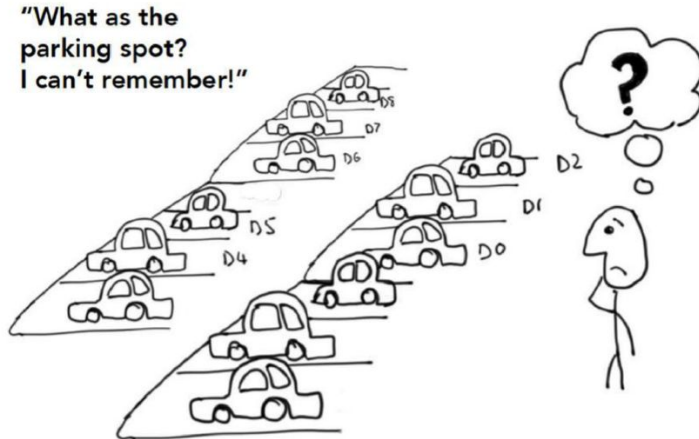
Breaking down the problem

The parking information is needed by the user at two instances:

While parking the car:



While looking for the car:



Research

With a clearer understanding of the challenge, key requirements, constraints, and desired outcomes, the research process was initiated to deeply explore user needs and evaluate existing solutions.

- + Secondary research: **Competitive Analysis**
- + Primary research: **Intercept interviews**
- + Primary research: **Observation - Experience Mapping**



Research | Secondary

Competitive Analysis

As part of the secondary research, a competitive analysis was conducted to evaluate existing solutions for saving and locating parking spots. These solutions included standalone applications as well as integrated features like those in Google Maps/Assistant.

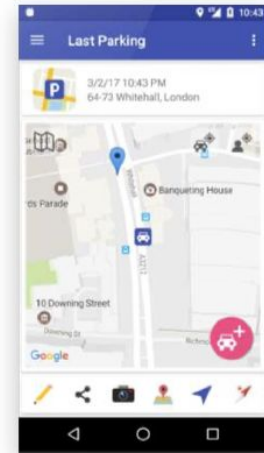
While most options were well-designed and user-friendly, they **required some level of manual input from the user** (except Google) and often **struggled with accuracy**.



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



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



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

Research | Primary

Intercept interviews

For our primary user research, we elected to conduct intercept interviews in parking lots. This method was selected due to its efficiency and the rapid insights it provides.

Conducting interviews in this contextual location is particularly valuable as it captures users' emotions at a point where they are significantly influenced by their experience.



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



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



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

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

● Record Information

● Deliver Information

Research | Primary

Observation – Experience Mapping




The experience mapping process was done as a part of the primary research which involved analyzing user interactions during parking and finding their car, structured using the AEIOU framework.

This helped visualize the user journey, **identifying key touchpoints** and **pain points**. Activities like parking the car, locating it in large lots, and using tools like mobile devices or honking features were mapped against environmental and interactional factors such as confusing signage and peak-time visibility issues.







Red dots highlighted moments for recording information, while blue dots marked opportunities for delivering information. This mapping provided an understanding of opportunity points in the user journey of parking and finding the car.

Experience Mapping using **AEIOU** framework
(Activities, Environment, Interactions, Objects, and Users)

Parking the car:

	Activities	Environment	Interaction	Objects	Users
Enter	Drive through gate 	Parking entrance	With Car	Car	Driver (Employee)
Park	Park the car	Parking spot	Drive according to the spot and environment	<ul style="list-style-type: none"> • Own car • Other parked cars • infrastructure 	Driver (Employee)
Buy a Ticket	Get down the car 	Parking lot	Operating the mobile app/ ticket kiosk	Mobile device/ ticket kiosk 	Driver (Employee)

Finding the car:

	Activities	Environment	Interaction	Objects	Users
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)
Buy a Ticket	Exit the parking lot 	Parking lot	Driving the car		Driver (Employee)

 Record Information
  Deliver Information

Key Learnings:



While Parking

Efficiency is critical for a seamless parking experience.

Users want the parking process to be quick and seamless, avoiding delays. Large Users want to complete the parking process quickly and efficiently, avoiding large parking lots that take more time to navigate.



While Locating the Car

Poor visibility and inadequate signage create navigation challenges.

Users struggle to locate their cars in large parking lots, especially during peak times, due to reduced visibility and unhelpful signage.



Users value precise and effortless solutions for finding their cars.

The reliance on honking features highlights the importance of accurate and intuitive tools that guide users effectively to their parked vehicles.

Design Principles

Drawing from initial considerations, assumptions, and research insights, the following design principles were established. These principles provided a foundational framework for brainstorming and generating ideas for the final solution.

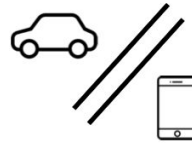
Ensure Accuracy: The recorded parking location must be precise and reliable.

Vehicle Independence: The feature should function independently of the vehicle, without requiring any direct integration.

Minimal Interface Intrusion: The feature should operate seamlessly without occupying any space on the home screen of the company application.



The parking location recorded should be accurate.



Feature should be independent of the vehicle.



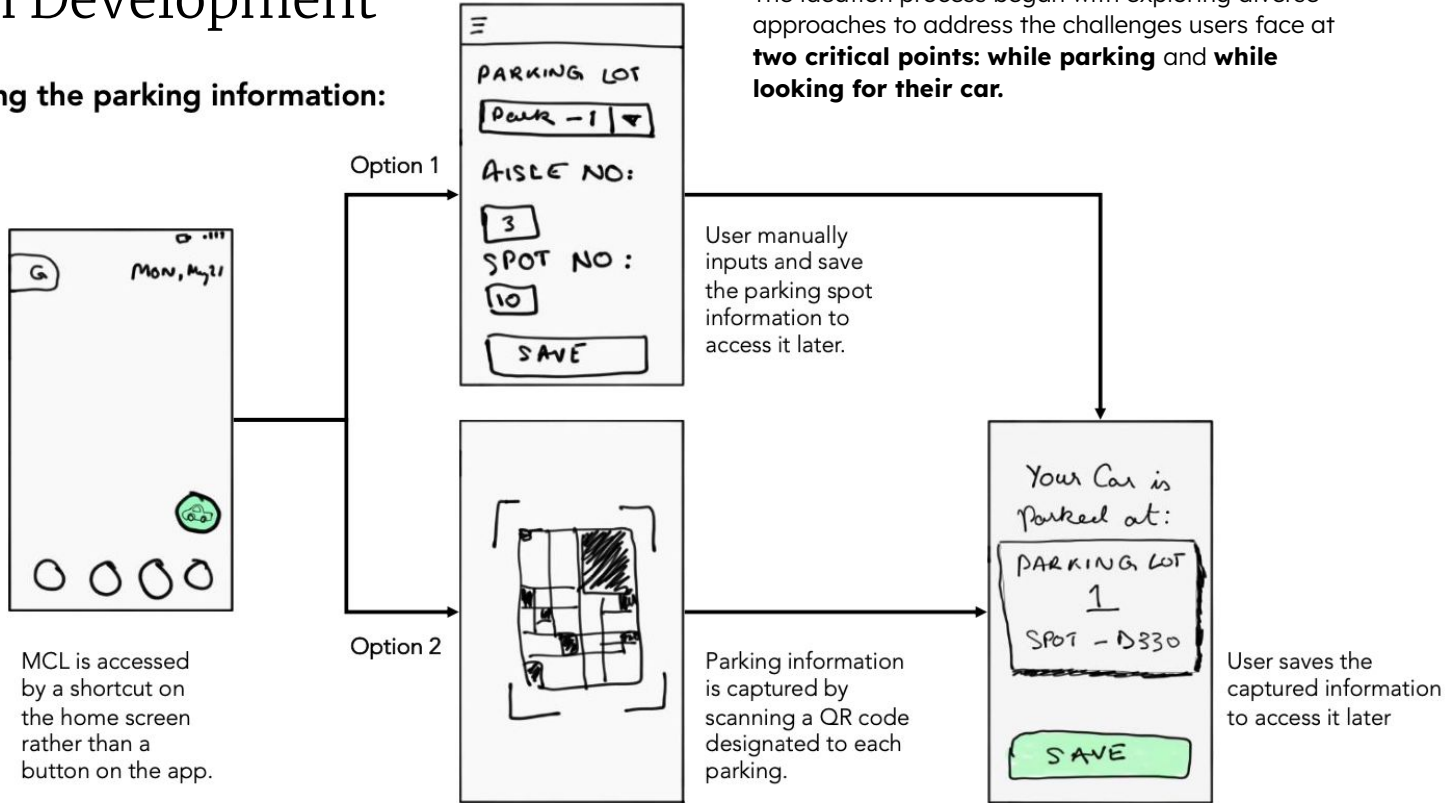
Feature should not use any space on the home screen of the company application.

Central Question:

How might we design an **intuitive** and **efficient** feature that helps users **accurately** locate their parked cars in large parking lots, **without** requiring **extensive user input** or occupying additional space on the app's home screen?

Solution Development

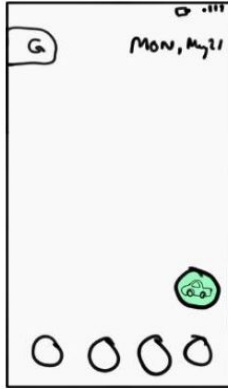
1) For recording the parking information:



The ideation process began with exploring diverse approaches to address the challenges users face at **two critical points: while parking** and **while looking for their car.**

Solution Development

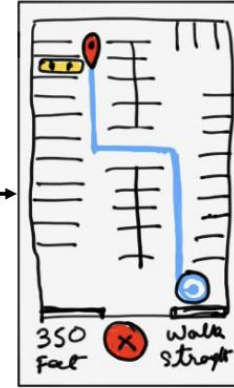
2) For finding the car in the lot:



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.

Solution Development | Testing

Feedback from low fidelity prototype testing was instrumental in refining the initial concepts for the parking solution:

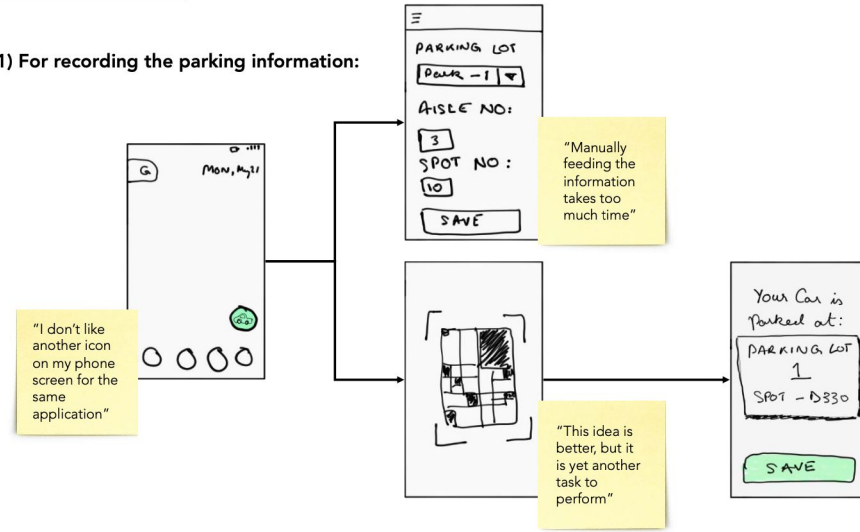
Manual entry: Users found entering parking details manually too time-consuming.

Additional icons: Users disliked the idea of adding extra icons to their home screens for the feature.

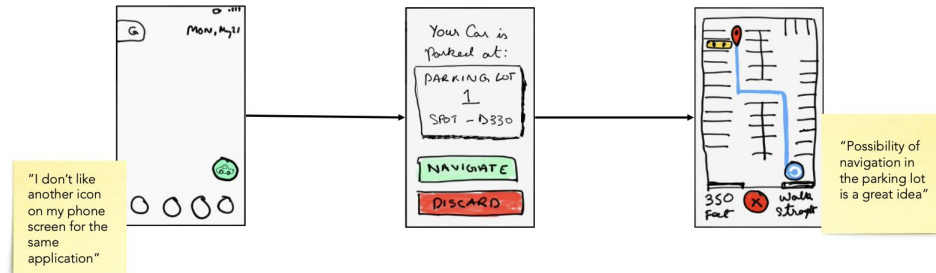
Navigation feature: Users appreciated the concept of navigation within parking lots, valuing its potential for precision and ease of use.

This feedback underscored the need for solutions that minimize user effort, provide accurate location guidance, and integrate seamlessly into the existing app experience.

1) For recording the parking information:



2) For finding the car in the lot:



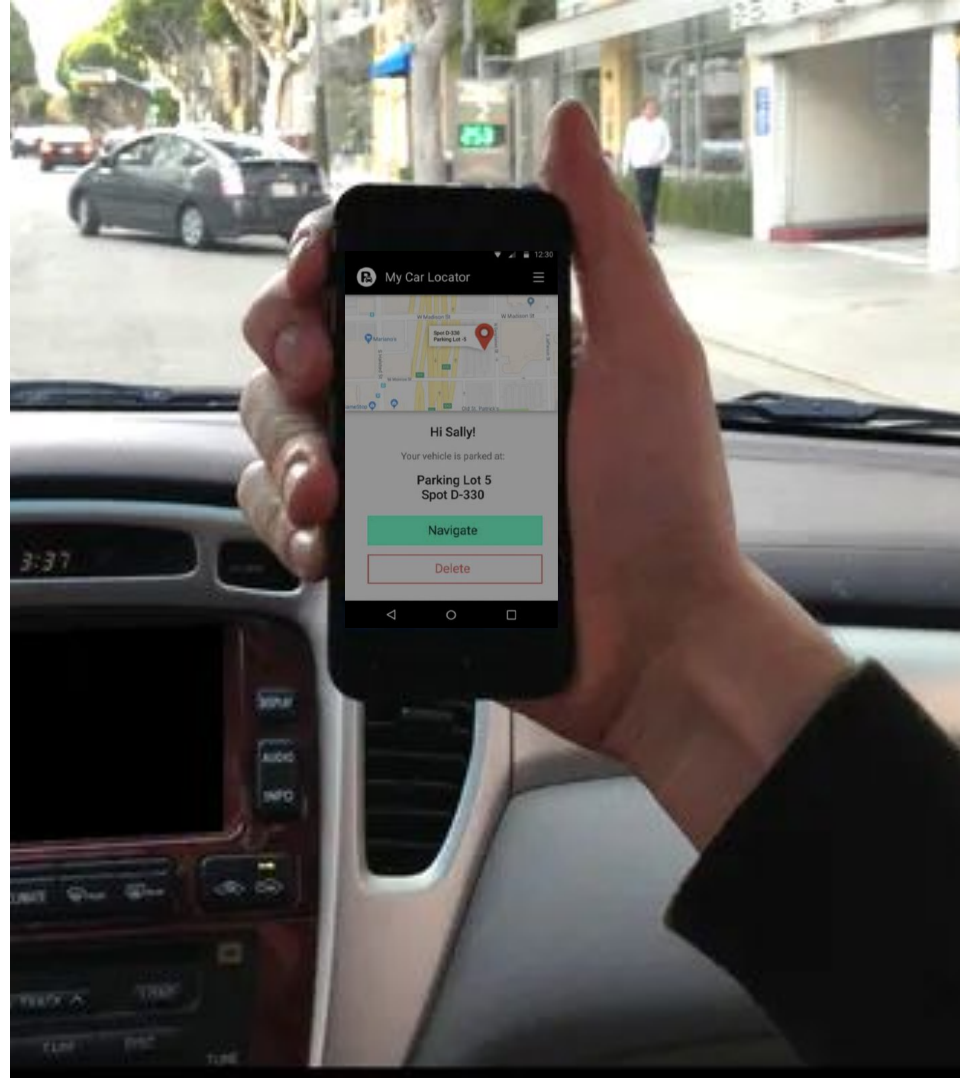
Solution Development | Refined Design

The final design seamlessly integrates parking location recording and retrieval into the company's app, prioritizing user convenience and accuracy.

For recording the location, the app leverages location services to detect the parking lot and sends a notification prompting users to confirm their parking spot with a single tap. If no action is taken, the spot is automatically saved, ensuring minimal user effort.

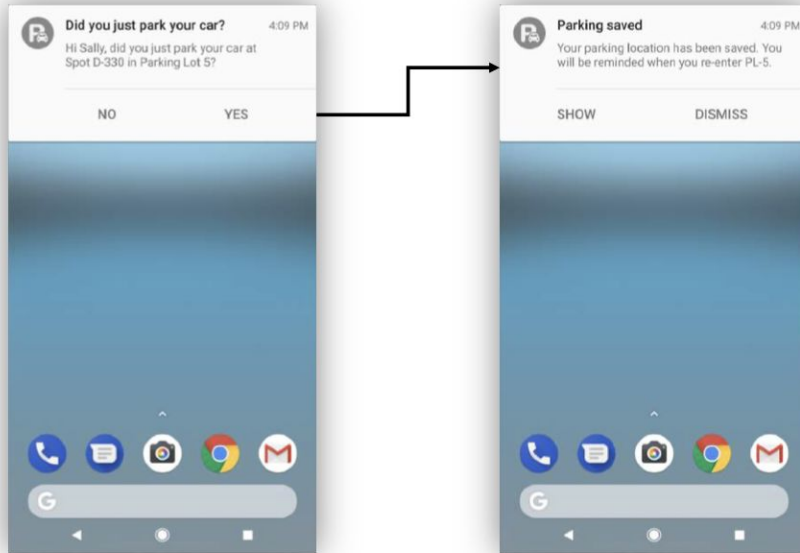
For retrieving the car location, users receive notifications with options to view their parking details or navigate directly to the spot. Navigation features include turn-by-turn directions displayed on a map or augmented reality (AR), providing precise guidance.

This solution eliminates the need for manual input or additional app icons, ensuring a quick, efficient, and frustration-free parking experience.



Solution Development | Features

1) For recording the parking information:

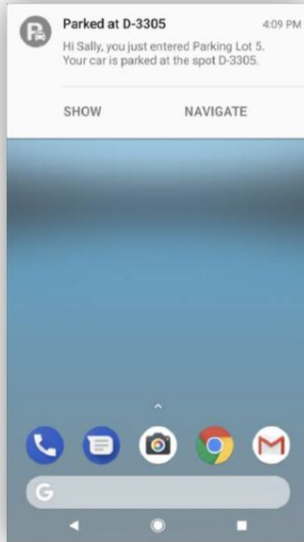


Clicking on "YES" option confirms that the parking location has been saved, using another notification.

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

Solution Development | Features

2) For finding the car in the lot:



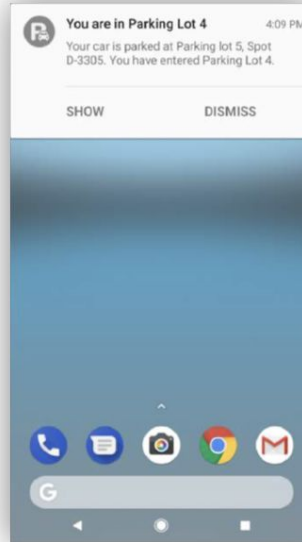
When the user enters the parking lot again, he gets a notification informing them about their parking spot.

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.

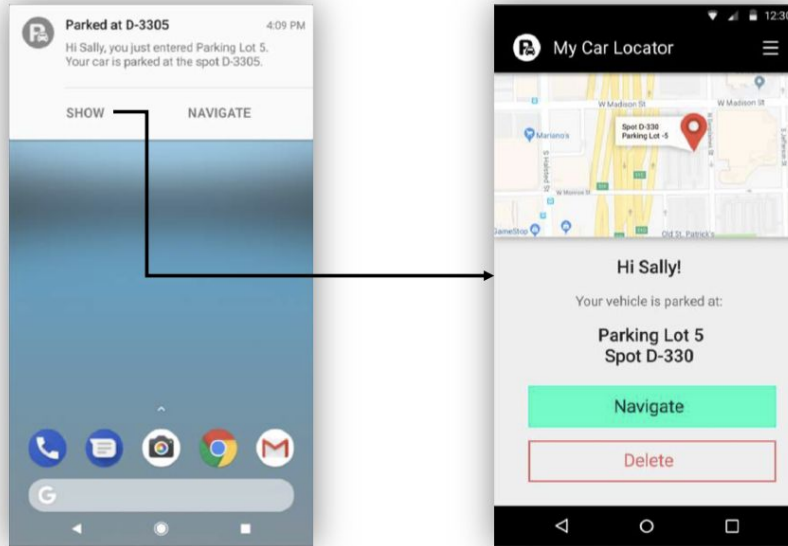


If the user enters any other Parking Lot than where he has parked his vehicle originally, he gets a notification that reminds him of his original parking spot.

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

Solution Development | Features

2) For finding the car in the lot:

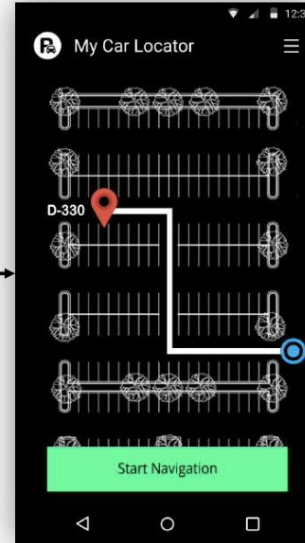
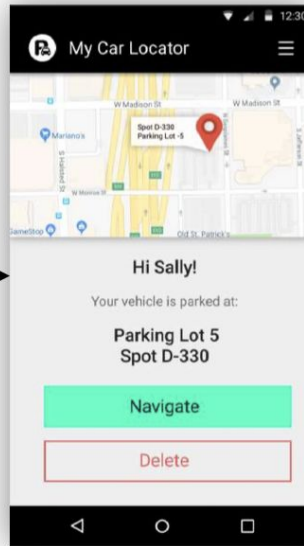
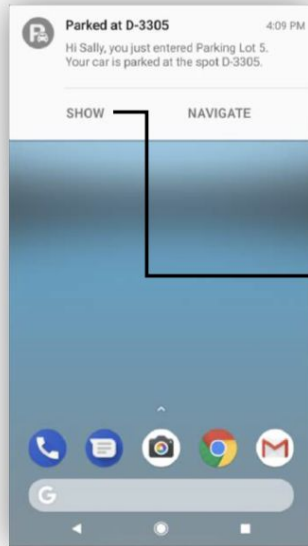


When the user clicks on "SHOW" in the heads-up notification, the application opens and the parking location is displayed on a map, as well as the exact address is also displayed.

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

Solution Development | Features

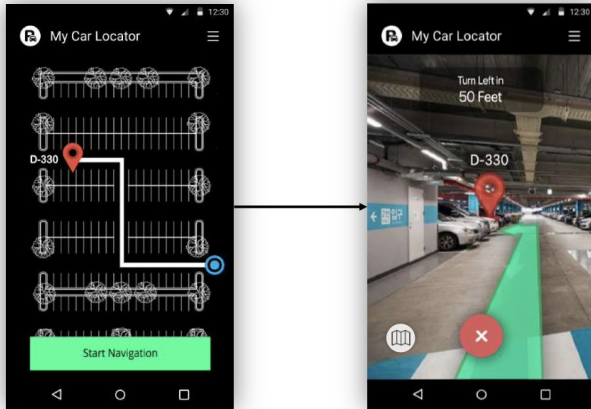
2) For finding the car in the lot:



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

Solution Development | Features

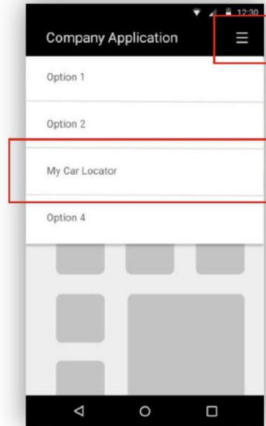
For finding the car in the lot:



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.

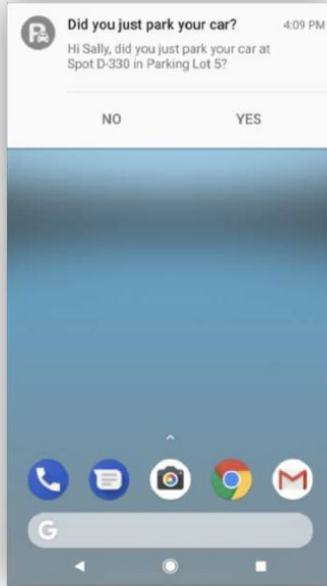
For accessing the parking information when not in the parking lot:



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

Suggested improvements for future versions

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.

Conclusion & Reflection



This project tackled parking and vehicle location challenges on a large corporate campus by combining user-centric research with innovative design. Key insights led to a seamless app feature with automated parking recording and intuitive navigation, using GPS and augmented reality for precise guidance.



While the project effectively addressed key user challenges, opportunities for further learning remain. **Adapting the feature to diverse parking environments, such as multi-level garages and outdoor lots, along with integrating insights from pilot testing, will be essential for improving its scalability and maximizing its impact.**

The End.