

Car Finder

Human Factors
Re-Design Project
Yaagni Patel

Introduction

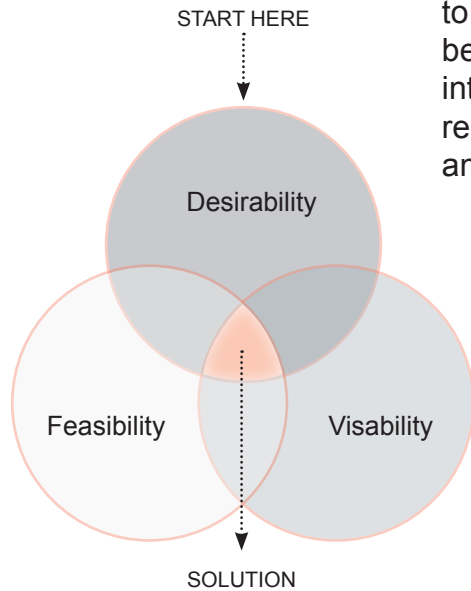
The aim of this project is to identify a problem within the current service of how people park and subsequently find their cars after parking in large multi-storey or open field car parks. The current system used to pay for parking is through a machine or through paying on your phone. There are no additional services to help drivers locate their car after parking it. Drivers can have a lot on their mind and remembering where they parked their car can be the last thing on the list. It is a frustrating process that no one enjoys. This service re-design should be able to provide the driver with all the information they need to pay and find their car without any stress.

Different types of research methods have been used throughout this process to help understand the core issues that people are facing when using these services. A primary ethnographic technique that has been used throughout this project is observation and think aloud protocol as they provide information on how the person reacts to certain situations. Both qualitative and quantitative techniques have been used through the research process to gain a better overall understanding of what needs improvement.

I believe that by improving the car park and pay experience for many drivers **will achieve** a more calm, convenient and less time consuming way of carrying out this particular task.

I will know it is true when the user can identify their own thinking process and realise that there is a better and easier way of locating and paying for parking.

User Research Strategy



When carrying out a user research strategy there are many ethnographic techniques to choose from. Table 1 shows the pros and cons of the different techniques that can be used. These techniques are used to help identify the problem and how the user interacts with the product or service. To ensure the solution provided reaches the service requirements there are 3 lenses in which the solution must fall into, desirability, feasibility and visibility. (IDEO, 2014).

- 1 Observational**

This method was chosen as it will be the most effective when gathering information about people's behaviour and actions.
- 2 Surveys & Questionnaires**

This method was chosen to analyse the information of whether people find it difficult to locate their car.
- 3 Think aloud protocol**

This method was chosen to analyse the thought process people go through when parking their car.

These research methods are appropriate for this redesign project as they do not require much time to gather results and they are suitable for a system user experience design.

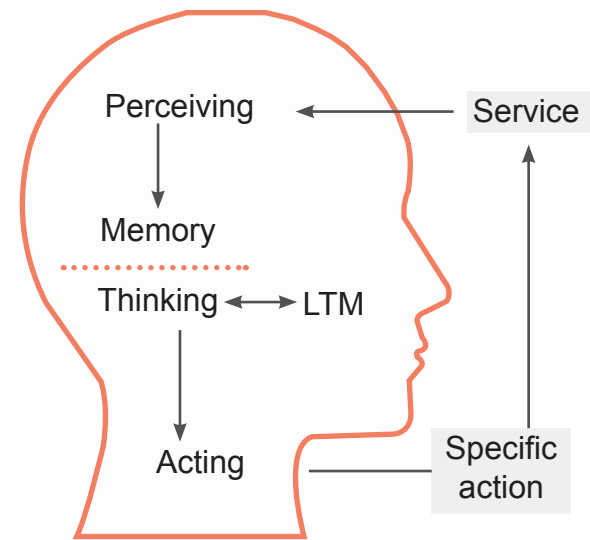
Methods	Results	Pros	Cons
Interviews	Mostly qualitative	Less expensive than ethnographic observation; getting people's experience by their words	Time consuming, interviewer's experience might influence the result
Questionnaire	Quantitative and qualitative	Cheap, easy for analyzing data rapidly, good for specific questions	Not flexible as interviews, questionnaire design is crucial
Observation	Mostly qualitative	Direct to get the information about people's natural behavior	Context might influence the participant's performance
Audio and video data recording	Mostly qualitative	Repeat reviewing of the data	Time consuming, might be limited in public places
Diary study	Mostly qualitative	Fill the gap when the observer is not around the participant	Might need more time to analyze a large amount of data from participants
Focus group	Mostly qualitative	Allow to raise diverse issues	Time consuming for analyzing the recorded conversation
Field research	Mostly qualitative	Understand people's natural behavior in their daily life in the context	Time consuming and high cost for collecting information; sample size might small
Performance measures	Quantitative and qualitative	Provide both quantitative and qualitative data for analyzing users' interaction behavior with the system	Principles of calculating times, errors, interrupts, and silences are essential
Think aloud protocol	Mostly qualitative	Understanding the participant's thoughts during operating a device	It might be difficult for participants to talk out loud and operate the device at the same time; time consuming for transcribing the audio recording
Log file analysis	Quantitative	Collecting data without interrupting the system performance	It might incur ethical considerations due to observing participants without their perception
Ethnography	Qualitative	Understand details of people's life	Might take weeks even years to collect data

Table 1. Pros and Cons of Evaluation Approaches (Karkowski et al., 2011)

Thinking Process

“Cognition refers to the ability to process information, hold attention, store and retrieve memories.” (Cambridge, 2013).

As shown in the diagram, thinking and working memory are closely linked together as an individual must continuously think about the situation they are in to be able to remember it. When carrying out a specific task, a person’s attention can be diverted through several distractions which can subsequently have an effect on how the task is carried out in that specific moment. Another factor that can distract the thinking and memory link is time pressure, for example, if you are in a rush to go somewhere and you park your car and go straight to the exit, you forget to look at the parking sign and the floor number. By not paying attention to the task at hand, and by thinking about something else, the brain does not process the information of where you may have parked your car. This can cause you problems later when you wish to locate your car but cannot recall the information that was essentially never processed.



Think Aloud Protocol - In a thinking aloud test, you ask test participants to use the system while continuously thinking out loud - this is simply verbalising their thoughts as they move through the service process. (Nielsen, 2014).

Please see Users & Personas page for the think aloud protocols when parking a car.

Pros

- Inexpensive - does not add any additional costs.
- Simply methodology process - not many mistakes can be made.
- Flexible - can be used at any stage of the design process or even several times to see how peoples perception may have changed because of the product or service provided.

Cons

- Bias behaviour - the participant can alter what they say to what they think to provide information that will help or hinder the product or service.
- Unnatural - some participants may forget to say some information that they are thinking because it is not normal for them to be saying everything they think. This can also alter the results.

Existing System Analysis



First step is to accept a ticket from the machines at the entrance barrier



Then you drive around the parking lot to find a space



Once parked, proceed to the exit via the stairs or the lift to your destination.



Take a mental note of the floor and area that you parked in.



When you are ready to leave, pay for your parking at the machine



Now try to remember where you parked your car and find your vehicle

The problem identified through carrying out this process is that when parking your car, the driver's attention is focussed on finding a space and going to the exit. Therefore, the process of taking a mental note of where you parked can be missed out or forgotten after a certain period of time due to alternate distractions. This is common in many large parking complexes that have poor or minimal signage of the parking level and row. If stage 4 is not completed thoroughly then stage 6 will take time to complete and can get frustrating for the car owner. Parking tickets only allow you to pay for the parking but even these can be lost or thrown away by accident therefore making it harder for the driver to pay for the parking, which in turn causes problems in stage 5 of the parking process.

User & Persona



Maya

Age: 19

Occupation: Student

Number of years driving: 1

Bio: Maya is a Geography student at Nottingham University. She started learning how to drive when she was 17 and it took her 3 times to pass her test. She is not a very confident driver as she has not driven much whilst being at university but when she is home she drives her and her friends to the shopping centre to hang out. Her friends can sometimes be a distraction for her when she is driving as they talk and listen to music.



David

Age: 46

Occupation: Pharmacist

Number of years driving: 26

Bio: David is an experienced driver and has driven all over the world when on holiday. He drives to the airport a few times every month to pick up and drop off his wife, as she travels a lot for her work. David is constantly working and on the go which can force him to be on the phone when driving in his car. Although he uses handsfree, the phone call can be a distraction when he is trying to drive.



Marie

Age: 79

Occupation: Retired Nanny

Number of years driving: 50

Bio: Marie lives at home on her own as her husband passed away a few years ago. He used to drive her everywhere but now she needs to be more independent by driving herself to the shops and the doctors on a regular basis. She has not driven in a long time but is getting used to the changes on the road and in car parks. Her son recently got her a smart phone which she is trying to work out.

The think aloud protocol was carried out by these 3 people. The task was to enter a large car park whether at shopping centre or the airport and record what they are thinking. They should not stop or alter anything they say or tell people what they are doing.

Think Aloud Protocol

- Drive up to the barrier at shopping centre and take ticket
- Drive through the barrier
- Finding parking whilst talking to friends
- Finds a spot, parks car whilst still talking to friends
- Locks car and put keys in handbag
- Put parking ticket in phone case
- After shopping goes to level 3 because her friends told her that is where she parked.
- Struggles to remember where she put the parking ticket and remembers it is in her phone case
- Pays for parking
- Walks around trying to find car but turns out they parked on level 4 not 3
- Finally finds her car and drives towards the exit

Think Aloud Protocol

- Drives up to the barrier and takes a ticket
- Drives through the barrier
- On the phone with a business partner
- Parks and sits in the car until phone call is finished
- Exits the car and gets a phone call from his wife saying she is waiting for him
- Rushes to the Airport arrivals to meet her
- After collecting her he goes to the machine to pay and there is a long queue
- Trying to find his paper ticket to pay for the parking but he cannot remember where he put it
- Calls for assistance and they had to sort it out to allow him to pay for the parking
- Wife is not pleased

Think Aloud Protocol

- Drives up to barrier and takes a ticket
- Drives through the barrier
- Finds parking space in disabled spaces near the entrance and parks car
- Puts ticket into purse
- After shopping, gets to pay machine
- Struggles to figure out how to use it and has to ask some other people for help
- After figuring it out and paying she finds her car and her car
- Gets into her car and drives towards to exit

Environment & Scenarios

Types of car parks :

- Outdoor open space in a field
- Outdoor Open space outside shop E.g Costco
- Multi-storey car park with no space indication signs
- Multi-storey car park with spaces indication and green light for parking space availability
- Underground car parks

Parking pay methods:

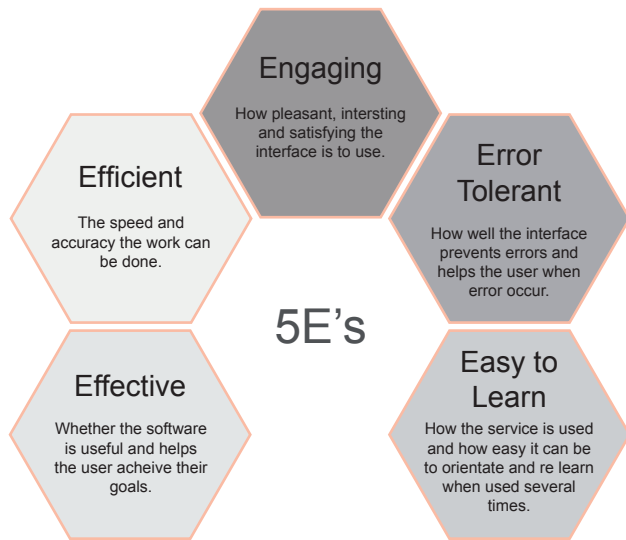
- Machine by the stairs / lifts
- Pay by Phone apps
- Parking ticket machines in smaller car parks
- Coin machines by parking spaces (mostly in the US)

Main areas for large car parks:

- Airport
- Shopping Centres
- Central London e.g. Q-park in China Town
- Large Concert / Sport Arenas



Usability Principles



DIMENTION	SERVICE DEFINITION
Effective	The software interface will be useful as the user will be able to carry out all tasks throught their mobile devices.
Efficient	The service will be quick and easy, with the app presenting few options and minimal number of clicks to complete the task.
Engaging	The interface will look appealing, friendly and simple to navigate through for ease of use and to reduce distractions when carrying out the task.
Error Tolerant	Check and cancellation options will be available and allowing the user to redo the task can prevent or solve any errors that may occur.
Easy to Learn	Interface must be easily remembered for when the user uses it again after a long period of time. Step by step guides can be provided to help navigate the user around the application.

(Quesenbery, 2004)

Interface Navigation

Many people have smart phones and certain icons on the applications are similar therefore anyone using them can interpret what the icons represent easily. There are also navigational structures that need to be implemented to allow the user of the app to complete the task easily.

(IDEO, 2014)

- Make actions reversible. Try to ensure that all actions are easily and immediately reversible, and try to constrain the availability of actions that would result in undesirable or irreversible outcomes.
- Provide a 'back' button. Provide an obvious mechanism that allows users to get back to their previous location or home when navigating a menu structure.
- Avoid unseen menu items. Consider the memory implication of unseen content if scrolling is required to obtain more menu items.
- Keep menus consistent. Assist learning and recall through distinctive spatial positions for menu options and be wary of the potential confusion if these positions change.
- Avoid deep hierarchies. Where hierarchy is used, ensure that the current location within the overall hierarchy is always evident and try not to exceed three levels.

Testing Methodology

Questionnaires and Surveys

This questionnaire will be carried out before the user has interacted with the paper prototype. It will help evaluate their individual opinions on the current service. After they have used the redesigned service, they will carry out the questionnaire again, which will provide a more visual representation of how they felt when using the app. They will also be asked to rate the app against the 5 E's as this information will be useful for the final re-design of the app. Paper prototyping is a fast and simple way of mocking up an interface without the coding. The interface can be modified accordingly to user feedback and can help find any issues with the product interface. (Snyder, 2001). This method of testing and presenting the solution should prove most affective.

Did you find the process easy?



Did you find the system complex?



Did you feel confident using the system?



Do you think the system is easy to learn?



Did it take a long time for you to complete the task?



Do you need to know much before using the system?



Who

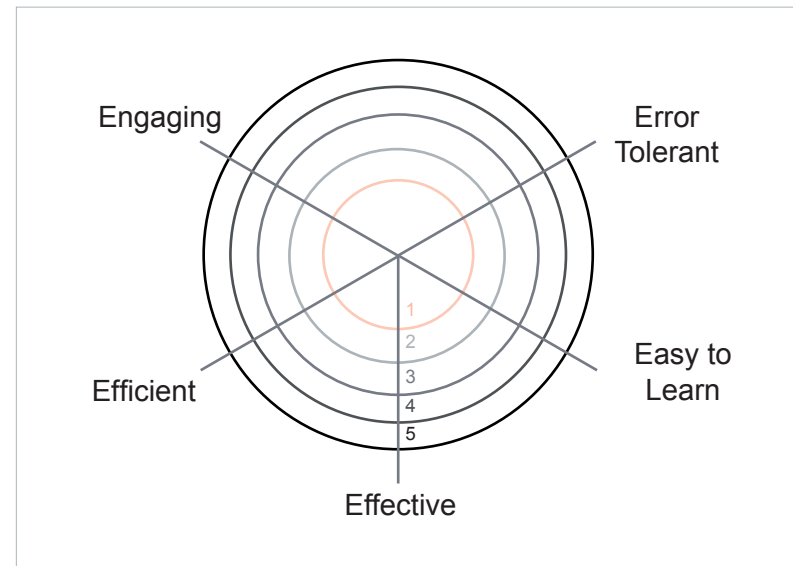
5 drivers of varying experience will carry out the test before and after using the parking service app.

What

- Inform participants of what they need to do
- Ask them to carry out the current parking process and complete the System Usability Scale questionnaire
- They will then look at image representations of the application and carry out the SUS questionnaire again and rate the app against the 5 E's.

Where

Heathrow Airport



By using this method to gather results of what they participants need it will help gain a better understanding of what areas of the re-design need more improvement or what areas need to be focussed on less.

Existing Service Analysis

Did you find the process easy?



Did you find the system complex?



Did you feel confident using the system?



Do you think the system is easy to learn?



Did it take a long time for you to complete the task?



Do you need to know much before using the system?



	Q1	Q2	Q3	Q4	Q5	Q6
USER 1	3	3	4	4	4	3
USER 2	4	2	5	5	3	1
USER 3	2	4	2	3	5	3
USER 4	4	2	4	4	3	2
USER 5	2	4	1	3	4	3

User 1 has been using ticket machines for a long time but found that the process took a long time as the que was long and one of the machines was out of service. Overall their experience wasn't bad but could be improved.

User 2 found the process easy as they had the correct amount of change on them and was prepared beforehand to pay for the ticket.

User 3 lost their ticket and it took them some time to find it. They then had problems with inserting money as the machine did not want to accept her note. This made her flustered as there were many people waiting behind her to use the machine

User 4 did not have any problems when paying for the ticket but they didn't have a small amount of change therefore received a large amount of coins as their change from a £20 note, which was frustrating.

User 5 was not from this country and had never used the machines before. They understood english but was wary of using the machines. The task took them some time as they struggled to find the correct amount of money.

Redesign 1

Already have an account

Park & Go

LOGIN

Username: _____

Password: _____

[Forgotten Password](#)

[Need Help?](#)

Create Account

Park & Go

Account

First Name: John

Last Name: Doe

Car Registration: LB16 KHD

Car Type: Audi A1

Email: john.doe@gmail.com

Phone Number

+44 712 345 678

Location Services ON OFF

Payment →

Cancel

Park & Go

Payment Details

Tick this box to save card details for future payments

Name on card: Mr John Doe

Card: XXXX-XXXX-XXXX-8297

Expiry: 07/20

CVV: 573

Location →

Cancel

Park & Go

Location Number: _____
(4 digit number found on the board)

Parking Space Number: _____
(3 digit number found on the floor of the car park space you are in)

Select time →

Cancel

1 Create an account / Login

When you first download the application, you must make an account. If you have already set up an account you can login using the username and password emailed when you first make an account. If you have forgotten your password or username you can click "forget password" to reset them. If you need any more help you can click the "need help?" button and that will lead you to FAQ page or a phone number you can call. Then click "Create Account" to continue to the next step.

2 Fill in the details

To make an account fill in the information that is required for the app to work. Your phone number and email is required to allow the app to send you a text and email of the receipt of your parking information. Remember to turn your location services "ON" to allow the app to track you and your car location. Then click "Payment" to continue. You also have the option to stop the process by pressing "Cancel". To go back you can press the back arrow at the top left side of the screen.

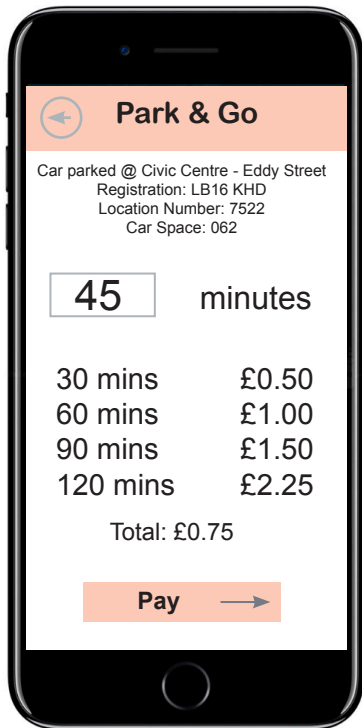
3 Add payment details

Adding your car payment details will reduce the need to constantly carry around change in your car. This can allow you to pay instantly and easily. Card details will be stored in a secure network and by ticking the box you don't need to fill out the details again. Click "Location" to add your car park and car space location. To go back you can press the back arrow at the top left side of the screen.

4 Add location number & parking space number

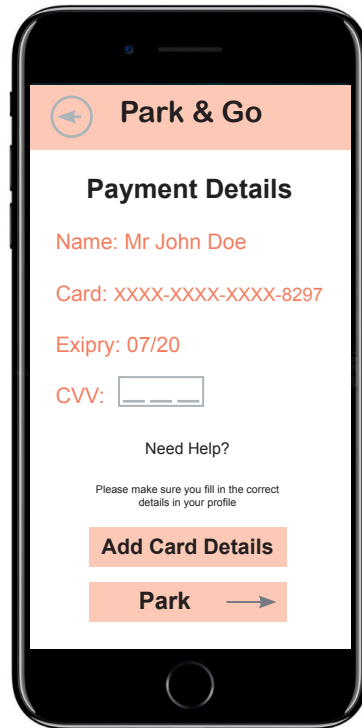
Each parking location will have their own number and each space will be logged with a number. At this stage, you must fill in the location and space number to allow the app to log where you are parked. Then click "Select time" to fill in how long you will be parked there for. To go back you can press the back arrow at the top left side of the screen.

Redesign 1 (continued)



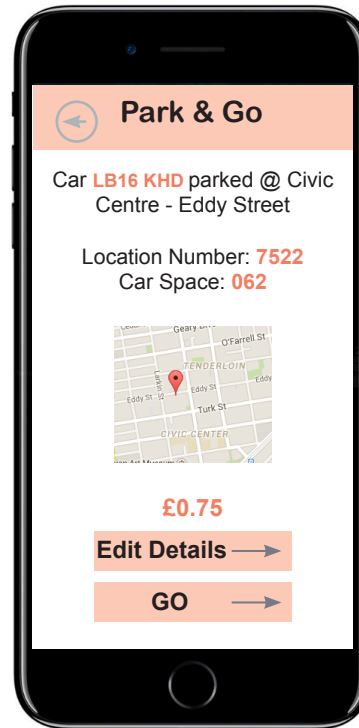
5 Select a time

At the top of the screen the location, space number and car registration will be displayed, if these details are wrong you have the option to go back and correct them. To go back you can press the back arrow at the top left side of the screen. Type in the number of minutes you want to park for and the payment will be calculated accordingly. Click "Pay" to continue onto the next step.



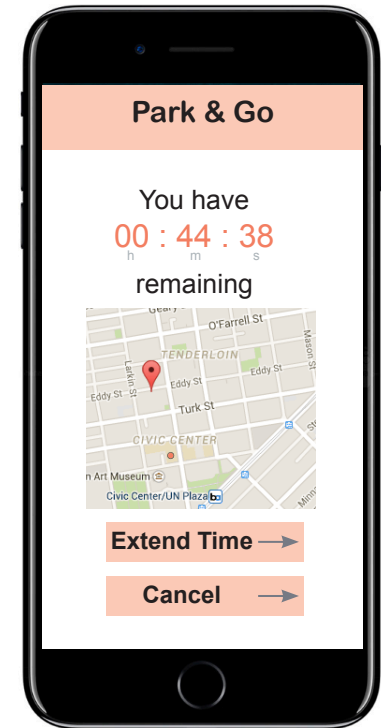
6 Pay for parking

If you have already put in your card details then they will come up automatically and to verify you need to type in the CVV on the card that is registered. If you need help then press "Need help?". If you haven't added your card details there is the option to do so. This will take you to screen 3. To continue click "Park" to the next step.



7 Double check parking details

This page will allow you to change any details that are wrong to prevent you having to pay and then realise that something is wrong in the details. Click "Edit Details" to change any information that is wrong. Click "GO" to finalise your transaction.

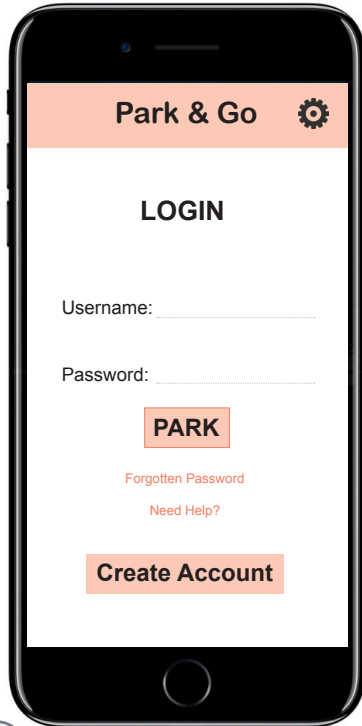


8 Timer Starts and Location is available of the phone and vehicle

This is the final page that will inform you on the details of where your car is and the time remaining on your parking. If you need to extend your parking you can do so by clicking "Extend Time" which will take you back to screen 5. You can end the parking by pressing "Cancel" but you will be charged for the whole parking time. This will then take you back to screen 1 where you can carry out another parking.

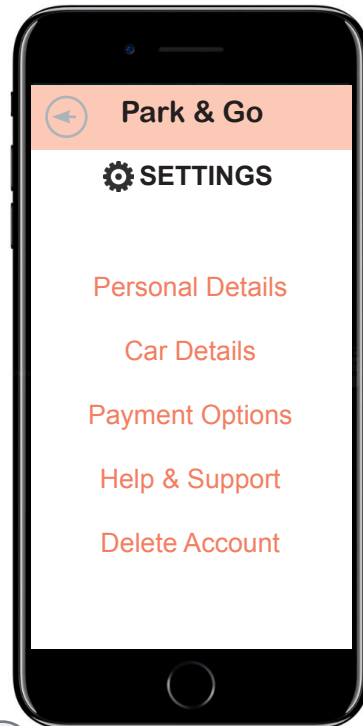
Redesign 2

Already have an account
go to step 5



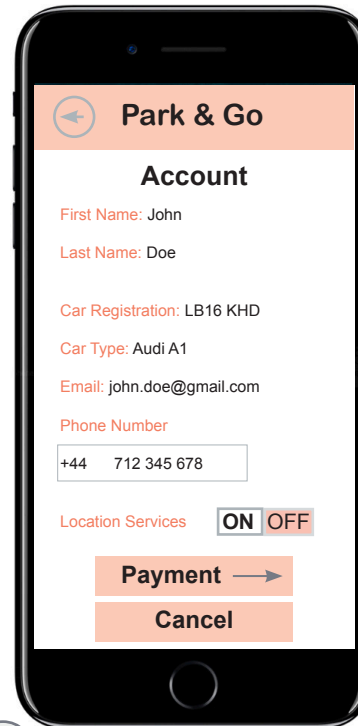
1 Create an Account / Login

When you first download the application, you must make an account. If you have already set up an account you can login using the username and password emailed when you first make an account. If you have forgotten your password or username you can click "forget password" to reset them. If you need any more help you can click the "need help?" button and that will lead you to FAQ page or a phone number you can call. Then click "Create Account" to continue to the next step. Click the settings icon at the top right side to alter information.



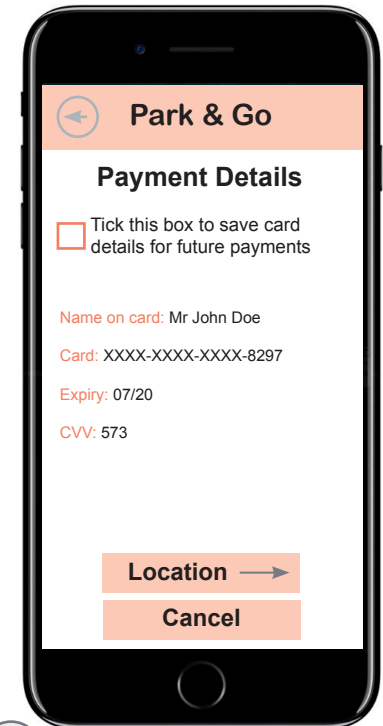
2 Settings

Setting page is available for you to change any details about your personal profile or you car details such as number plate. You can also change payment details and click "Help & Support" for an FAQ page or a phone number to call for help. If you do not want to continue using the app you can click "Delete Account" which will erase all your details on your account.



3 Add Personal Details

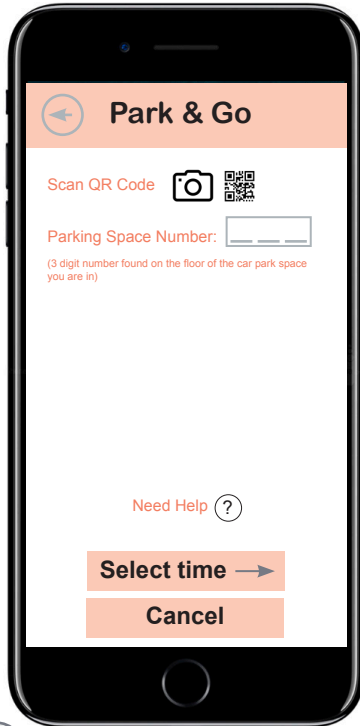
To make an account fill in the information that is required for the app to work. Your phone number and email is required to allow the app to send you a text and email of the receipt of your parking information. Remember to turn your location services "ON" to allow the app to track you and your car location. Then click "Payment" to continue. You also have the option to stop the process by pressing "Cancel". To go back you can press the back arrow at the top left side of the screen.



4 Add Payment Details

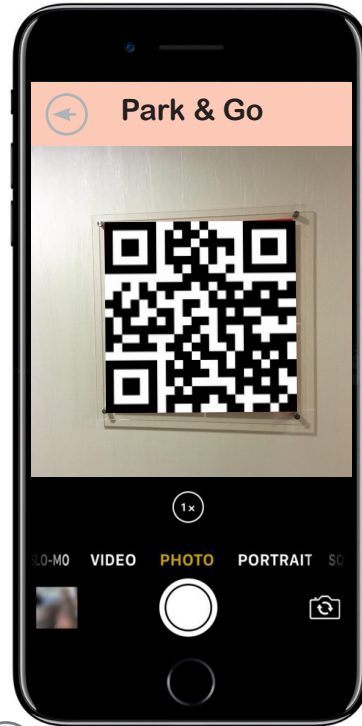
Adding your car payment details will reduce the need to constantly carry around change in your car. This can allow you to pay instantly and easily. Card details will be stored in a secure network and by ticking the box you don't need to fill out the details again. Click "Location" to add your car park and car space location. To go back you can press the back arrow at the top left side of the screen.

Redesign 2 (continued)



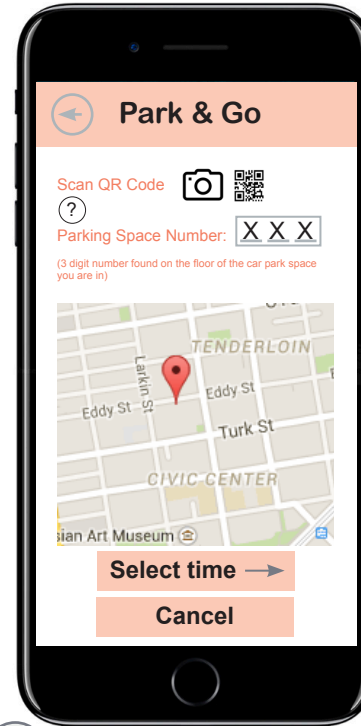
5 Scan QR Code

To download the location information instead of entering a code you can scan the QR code by clicking the camera icon on signs displayed around the parking lot. If you need help you can click the "Need Help" button. To go back you can press the back arrow at the top left side of the screen. Press "Cancel" to delete the transaction and start again.



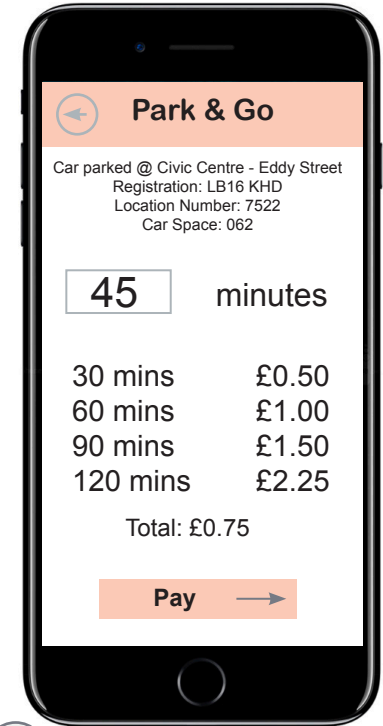
6 Scan QR Code

The QR code will look like the above image and will automatically insert the location into the app details. This can prevent people from putting in the wrong code.



7 Location Confirmed

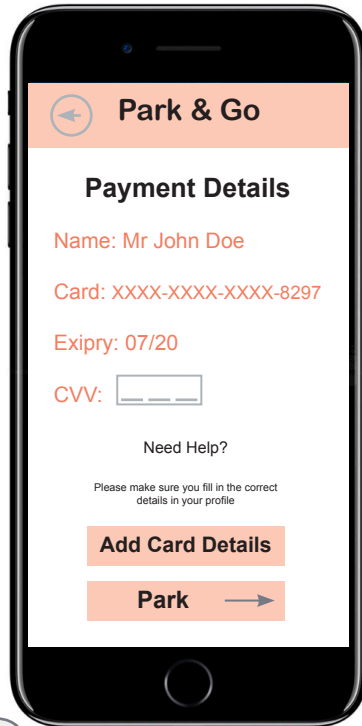
Once the QR code is scanned you can enter your 3 digit parking space number. Click "Select Time" to move onto the next step. To go back you can press the back arrow at the top left side of the screen. Press "Cancel" to delete the transaction and start again.



8 Select a time

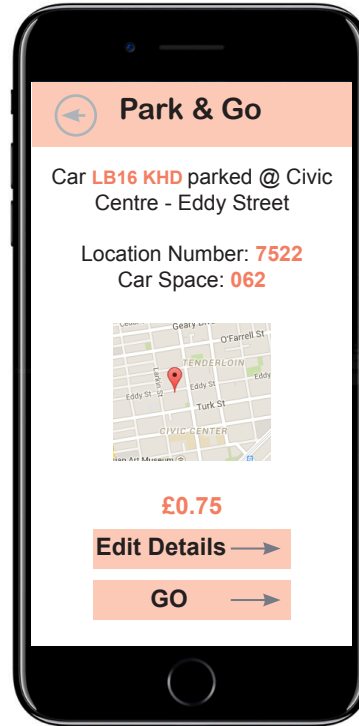
At the top of the screen the location, space number and car registration will be displayed, if these details are wrong you have the option to go back and correct them. To go back you can press the back arrow at the top left side of the screen. Type in the number of minutes you want to park for and the payment will be calculated accordingly. Click "Pay" to continue onto the next step.

Redesign 2 (continued 2)



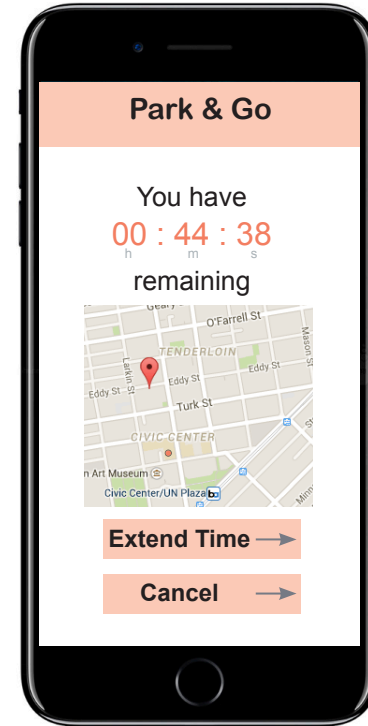
9 Pay for parking

If you have already put in your card details then they will come up automatically and to verify you need to type in the CVV on the card that is registered. If you need help then press "Need help?". If you haven't added your card details there is the option to do so. This will take you to screen 3. To continue click "Park" to the next step.



10 Double check parking details

This page will allow you to change any details that are wrong to prevent you having to pay and then realise that something is wrong in the details. Click "Edit Details" to change any information that is wrong. Click "GO" to finalise your transaction.



11 Timer Starts and Location is available of the phone and vehicle

This is the final page that will inform you on the details of where your car is and the time remaining on your parking. If you need to extend your parking you can do so by clicking "Extend Time" which will take you back to screen 5. You can end the parking by pressing "Cancel" but you will be charged for the whole parking time. This will then take you back to screen 1 where you can carry out another parking.

Feedback & Analysis

▲ Average Score

Re-design 1 Average Scores

Did you find the process easy? 4



Did you find the system complex? 1.4



Did you feel confident using the system? 4.4



Do you think the system is easy to learn? 4



Did it take a long time for you to complete the task? 2.2



Do you need to know much before using the system? 3



User Comments

- Having a memory / history section to allow you to search for previous parking locations rather than having to type in the Location again.
- What if you haven't used the app before but are in a rush to get somewhere and don't have the time to fill in the form?

Overall the results from this questionnaire showed that the app interface was easy to use and that the users were able to understand the process and the tasks that needed to be completed to park their car. They had a few questions on how the system would be put in place and it was explained that the car park would have to sign up for the app service. Overall there was positive feedback with constructive criticism on how to improve the app. Some users found the interface a bit boring and mundane.

▲ Average Score

Re-design 2 Average Scores

Did you find the process easy? 3.6



Did you find the system complex? 1.6



Did you feel confident using the system? 3.8



Do you think the system is easy to learn? 3.4



Did it take a long time for you to complete the task? 1.6



Do you need to know much before using the system? 2.4



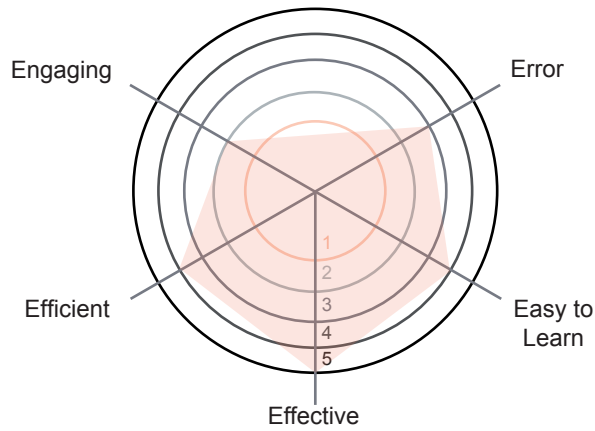
User Comments

- Having a memory / history section to allow you to search for previous parking locations rather than having to type in the Location again.
- Having the option to fill in a code incase your camera doesnt work incase the QR code is damaged from vandalism.

From this questionnaire, the results showed that it was easier to use than re-design 1 but slightly more complex with regards to the use of a QR code. 1 person out of the 5 did not know what a QR code was therefore the process had to be explained to them. The time it took to complete the task was less but they felt less confident with the system with regards to the QR code. They did find having a settings option gave them some comfort in knowing where to go if they need help or to delete their account.

Feedback & Analysis

Re-design 1 Average Scores



User Comments

Error: Some of the users struggled to see the back sign and would instinctively go for the cancel sign rather than the back sign. Therefore making them start all over again, which would result in more time in completing the task.

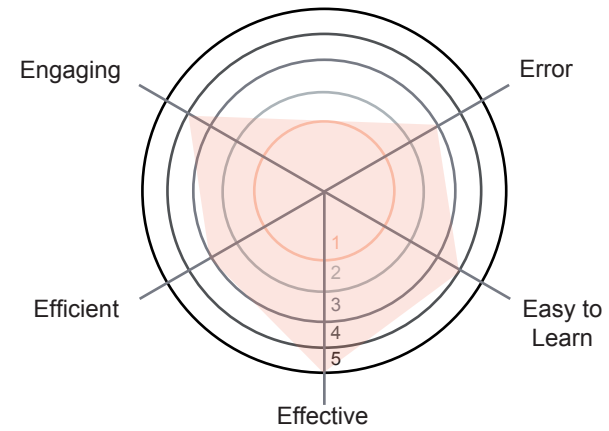
Easy To Learn: They found the process simple to navigate through.

Effective: There was no problem in completing the task through a mobile phone interface.

Efficient: The interface was not cluttered and signs were clear and simple to understand.

Engaging: The interface was too simple and right making the process boring and mundane.

Re-design 2 Average Scores



User Comments

Error: Same comments as in re-design 1 but would like help signs on more of the pages.

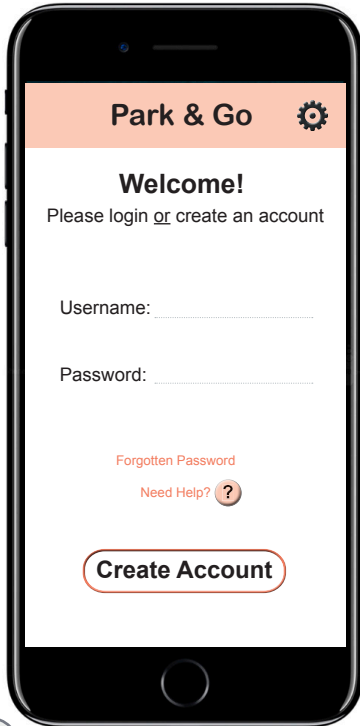
Easy To Learn: They found the process simple to navigate through.

Effective: There was no problem in completing the task through a mobile phone interface.

Efficient: The process was simple to use but there were concerns that they had to go back to the main page to access the setting.

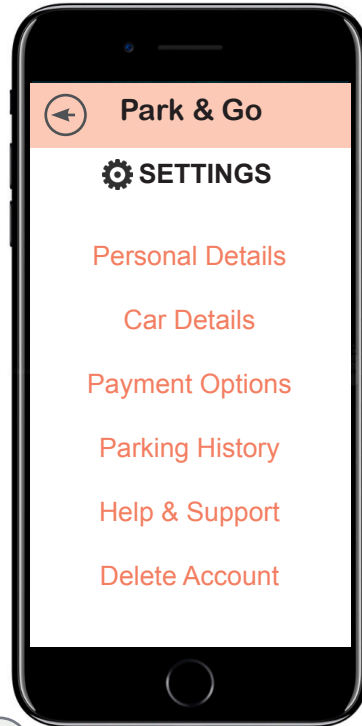
Engaging: They found the idea of scanning a QR code intriguing but there were the issues of where the code would be placed and if it did not work there had to be an alternative method.

Final Re-Design Proposal



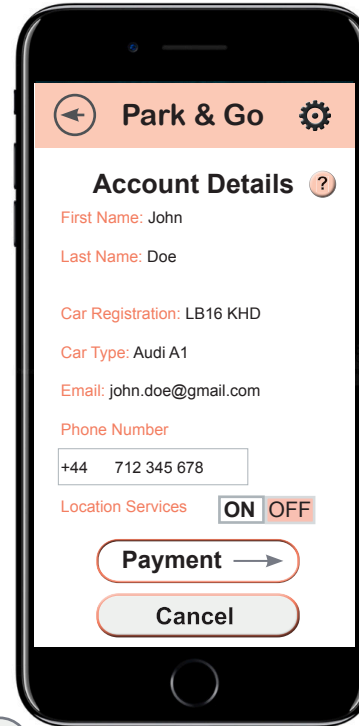
1 Create an Account / Login

When you first download the application, you must make an account. If you have already set up an account you can login using the username and password emailed when you first make an account. If you have forgotten your password or username you can click "forget password" to reset them. If you need any more help you can click the "need help?" button and that will lead you to a help page or a phone number you can call. Then click "Create Account" to continue to the next step (screen 3).



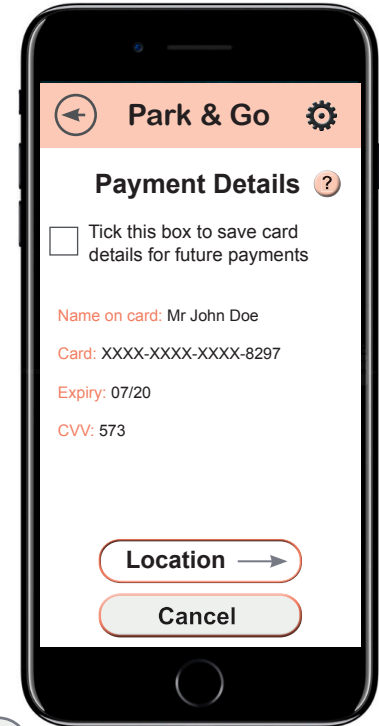
2 Settings

Setting page is available for you to click on every page of the app. Here you can change any details about your personal profile or you car details such as number plate. You can also change payment details under "Payment Options". Click "Help & Support" for an FAQ page or a phone number to call for help. (See screen 11) If you do not want to continue using the app you can click "Delete Account" which will erase all your details on your account. (See screen 12).



3 Add Personal Details

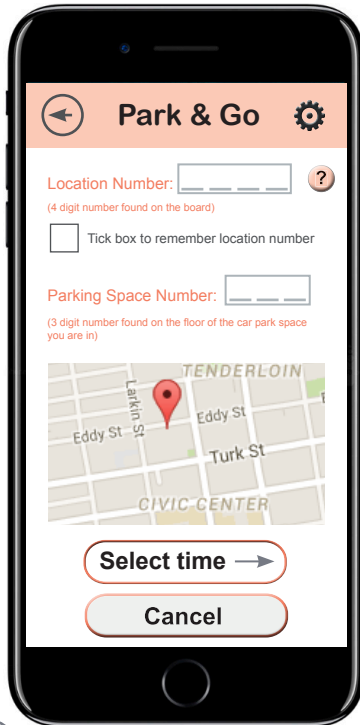
To make an account fill in the information that is required for the app to work. Your phone number and email is required to allow the app to send you a text and email of the receipt of your parking information. Remember to turn your location services "ON" to allow the app to track you and your car location. Then click "Payment" to continue. You also have the option to stop the process by pressing "Cancel". To go back you can press the back arrow at the top left side of the screen.



4 Add Payment Details

Adding your car payment details will reduce the need to constantly carry around change in your car. This can allow you to pay instantly and easily. Card details will be stored in a secure network and by ticking the box you don't need to fill out the details again. Click "Location" to add your car park and car space location. To go back you can press the back arrow at the top left side of the screen.

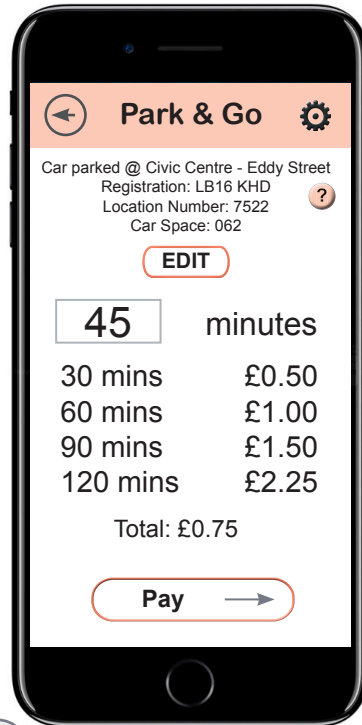
Final Re-Design Proposal



5 Add location number & parking space number

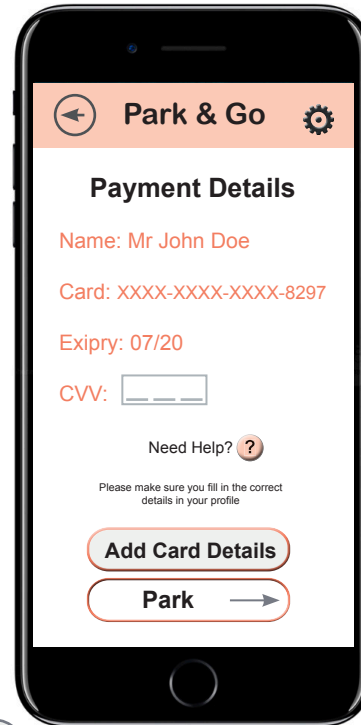
Each parking location will have their own number and each space will be logged with a number. At this stage you must fill in the location and space number to allow the app to log where you are parked. Then click "Select time" to fill in how long you will be parked there for. To go back you can press the back arrow at the top left side of the screen.

Alternatively, you can go to your "Parking History" in the settings (See screen 10) and park again at a previous location. The link will take you straight to this screen.



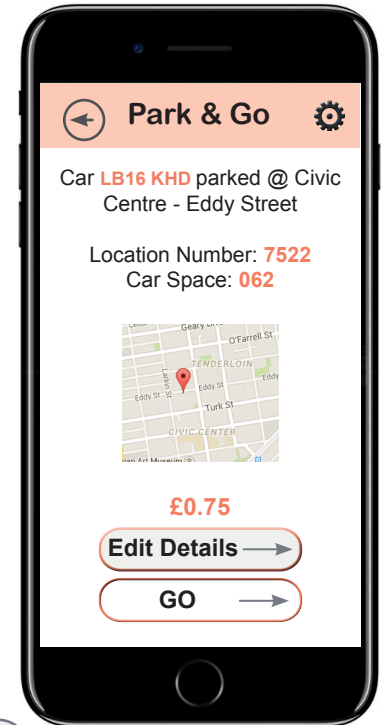
6 Select a time

At the top of the screen the location, space number and car registration will be displayed, if these details are wrong you have the option to go back and correct them or press "EDIT". To go back you can press the back arrow at the top left side of the screen. Type in the number of minutes you want to park for and the payment will be calculated accordingly. Click "Pay" to continue onto the next step.



7 Pay for parking

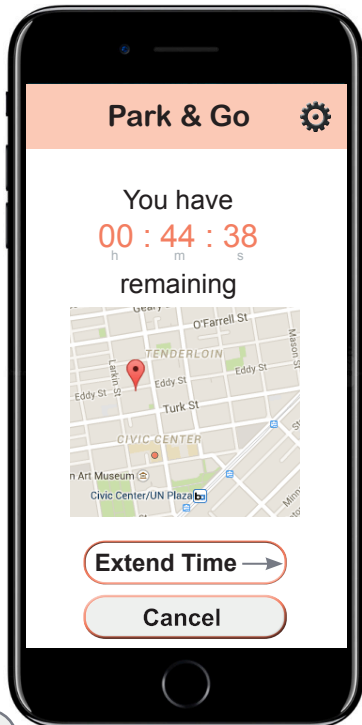
If you have already put in your card details then they will come up automatically and to verify you need to type in the CVV on the card that is registered. If you need help then press "Need help?". If you haven't added your card details there is the option to do so. This will take you to screen 3. To continue click "Park" to the next step.



8 Double check parking details

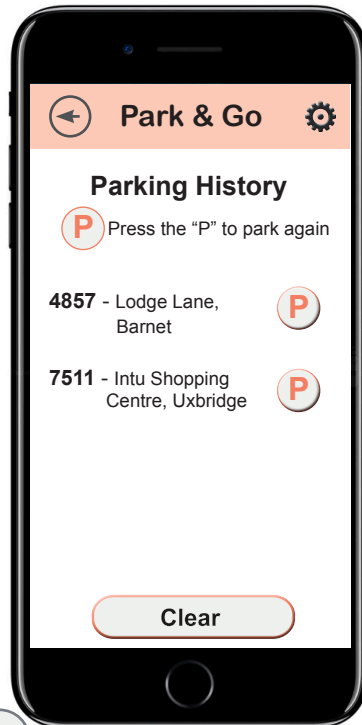
This page will allow you to change any details that are wrong to prevent you having to pay and then realise that something is wrong in the details. Click "Edit Details" to change any information that is wrong. Click "GO" to finalise your transaction.

Final Re-Design Proposal



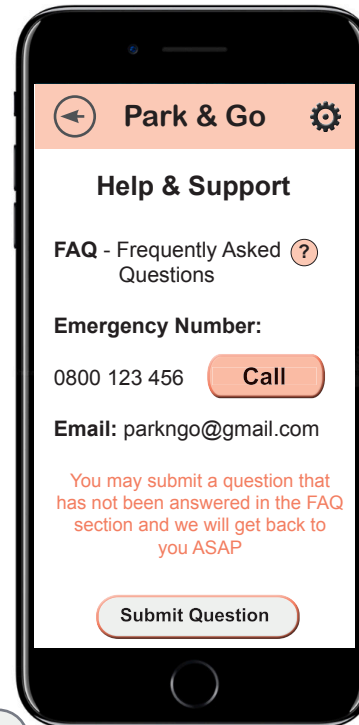
9 Timer Starts and Location is available of the phone and vehicle

This is the final page that will inform you on the details of where your car is and the time remaining on your parking. If you need to extend your parking you can do so by clicking "Extend Time" which will take you back to screen 5. You can end the parking by pressing "Cancel" but you will be charged for the whole parking time. This will then take you back to screen 1 where you can carry out another parking.



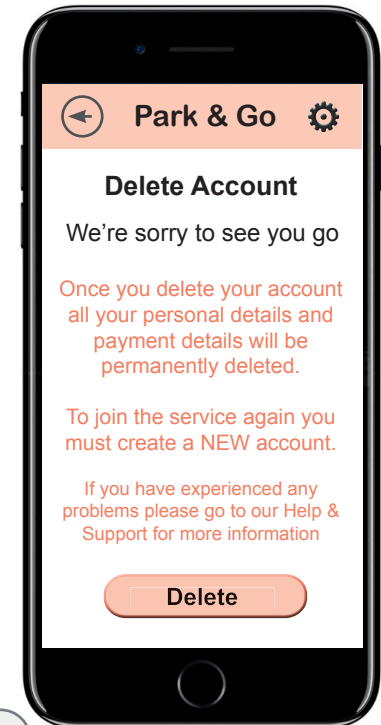
10 Parking History

This page is found in the "Settings" whereby you can see your previous parking locations. By pressing the "P" it will enable you to park at that location again and take you to screen 5 with the location filled in. You can press "Clear" to remove your parking history. This information cannot be retrieved again once cleared. To go back to the screen 1 you can press the back arrow at the top left side of the screen.



11 Help & Support

This page is found in the "Settings" and it is available to the user to find out any information about the app on how to use it. There is also a number that you can call to get help or an email that you can contact. If you cannot find your question in the FAQ section you have to option to email your own by clicking "Submit Question". To go back to the screen 1 you can press the back arrow at the top left side of the screen.



12 Delete Account

Deleting your account will mean your details will be permanently removed from the system. This means that if you wish to use the app again, you must create another account. If you do not want to delete your account you can go back to the screen 1 by pressing the back arrow at the top left side of the screen.

Evaluation

Feedback

The QR code was not easy for some people to understand and the issue of what if it doesn't work.

Solution

Instead of having the QR code reader, the user will have to put the code in manually or go to their history and find the location there. The QR code proved to not sit well with some people who were not familiar with the program.

Feedback

Accessing the settings was difficult as it was only on the first page.

Solution

Setting tabs on the top right of every screen was put in place to ensure the user can access it at any stage of the parking process.

Feedback

If the user is in a rush and does not have time to fill in their details is there a faster alternative method?

Solution

Unfortunately the parking has to be paid for at the time of parking otherwise the system may be abused and people may park there for free.

Feedback

The look of the app was a bit boring

Solution

The app buttons have been modified to add a softer touch and feel to the aesthetics.

Having taken the user feedback from the redesigns the final design has incorporated all the issues that were highlighted above. By following the users through processes and habits the re-design was able to address the needs of the user efficiently and effectively combining both payment of parking and location of the vehicle.

References

Cambridge (2017) Thinking. Available at: <http://www.inclusivedesigntoolkit.com/UCthinking/thinking.html#attention> (Accessed: 28 December 2017).

IDEO (2014) the Field Guide To Human-Centered Design, Igarss 2014. doi: 10.1007/s13398-014-0173-7.2.

Karwowski, W. (2011) Human factors and ergonomics in consumer product design: Methods and techniques. Edited by Waldemar Karwowski, Marcelo M. Soares, and Neville A. Stanton. Boca Raton, FL, United States: CRC Press

Nielsen, J. (2014) Thinking Aloud: The #1 Usability Tool. Available at: <https://www.nngroup.com/articles/thinking-aloud-the-1-usability-tool/> (Accessed: 3 January 2018).

Quesenbery, W. (2004) 'Balancing the 5Es of Usability', Cutter IT Journal, 17(2), pp. 4–11. Available at: <http://www.wqusability.com/articles/5es-citj0204.pdf>.

Snyder, C. (2001) Paper Prototyping, Paper Prototyping. doi: 10.1016/B978-155860870-2/50036-X.

Images:

<http://www.dailymail.co.uk/sciencetech/article-3758899/Mathematician-solves-puzzle-perfect-parking-lot-says-leaving-car-angle-key.html>

<http://kdc.com.my/wayfinding.html>

<http://www.europark.fi/ru/how-to-park-in-europark-ru/>

<http://www.thelibrarystore.com/product/85-0920p/>

<http://smarthighways.net/apt-skidata-expands-customer-care-team/>

<http://www.esacademic.com/dic.nsf/eswiki/317663>

<http://www.neatorama.com/2017/11/29/Man-Is-Reunited-With-His-Car-20-Years-After-Forgetting-Where-He-Parked-It/>

<http://www.thisismoney.co.uk/money/cars/article-4704378/Councils-parking-machines-won-t-accept-1-coin.html>

<https://www.shutterstock.com/video/clip-6793138-stock-footage-interior-view-of-man-driving-car-man-drinking-coffee-while-driving-the-car-man-driving-car-on-a.html>

<https://rekordcenturion.co.za/108997/tips-to-help-lower-road-accidents/>

<http://thenewswheel.com/the-truth-about-donating-your-car-to-charity/old-lady-granny-driving-car-woman-elderly-driver/>

<http://www.heraldsun.com.au/leader/news/melbournes-shopping-centres-the-good-the-bad-and-handy-tips/news-story/46cd9aa0197ff2ac24cf21bcc22292a8?nk=cef1e9a8ec4edf-f2ee4576878ae49a84-1515335396>

https://commons.wikimedia.org/wiki/File:Romford,_The_Brewery_Development_car_park_access_ramp_-_geograph.org.uk_-_906053.jpg

<https://www.thenbs.com/knowledge/design-recommendations-for-multi-storey-and-underground-car-parks>

http://www.groupfirst.com/news/?attachment_id=1071

<http://www.geograph.org.uk/photo/2412582>

<http://www.ampetronic.co/CaseStudies/zeag-parking-ltd-install-induction-loops/17017>

<https://fishofgold.net/2013/05/10/the-night-of-the-amorous-parking-meters/>

<https://www.myringgo.co.uk/apps>

<https://www.techworld.com/news/apps-wearables/chelsea-is-latest-london-borough-adopt-paybyphone-parking-app-3607909/>