4HC3: Assignment 2

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Design Document for Parking Meter

Introduction

Mechanical parking meters are widely used devices allowing you to insert coins, add time, and park your vehicle. Modern parking meters also support credit cards, however interaction with these systems have become increasingly more complicated and inconsistent, causing great usability issues.

This is a design document for a proposed Parking Meter User Interface(UI). The purpose of this design is to make parking easy, fast and minimize the amount of decision the user needs to make.

Overall Description

Our modern parking meter UI supports many of the features seen on other parking meters such as the ability to use coins, credit, and debit cards, add/remove parking time, print tickets for users to display on the dash board, and give refunds to users who return tickets.

We envision our parking meter in a futuristic public parking lot with many available parking spots.

Design Process

We began our design process by brainstorming possible additional features that may be useful for a parking lot. We also iteratively hand drew our initial UI design on a white board making it easier to add, remove, and modify our design before implementing it in code. We have attached pictures of our iterative design process at the end of the document. We have also created an HTA for purchasing parking time, attached at the end of the document.

Added Features

In our Parking Meter we have decided to add:

1. Text Reminder – This feature sends a text reminder to people who associate their phone number to a parking lot. Once there are only 10 minutes left in there parking, the user will receive a text message. This saves the user from constantly having to check the time and also informs the user when their parking ticket expires.
2. Parking Expiry – Although a simple feature, we decided to inform the user of when the parking ticket expired on their printed receipt.
3. Electric Car Parking – We added extra functionality to our design to consider modern/ futuristic parking lots that allow users to charge their electric cars while parking. As electric cars become more prevalent, this added functionality may be desired to many users.
4. Multiple Parking Spots – The ability to purchase multiple parking spots at once. This functionality was added to accommodate for large groups who all want to park in the same

parking lot.

Design Decisions

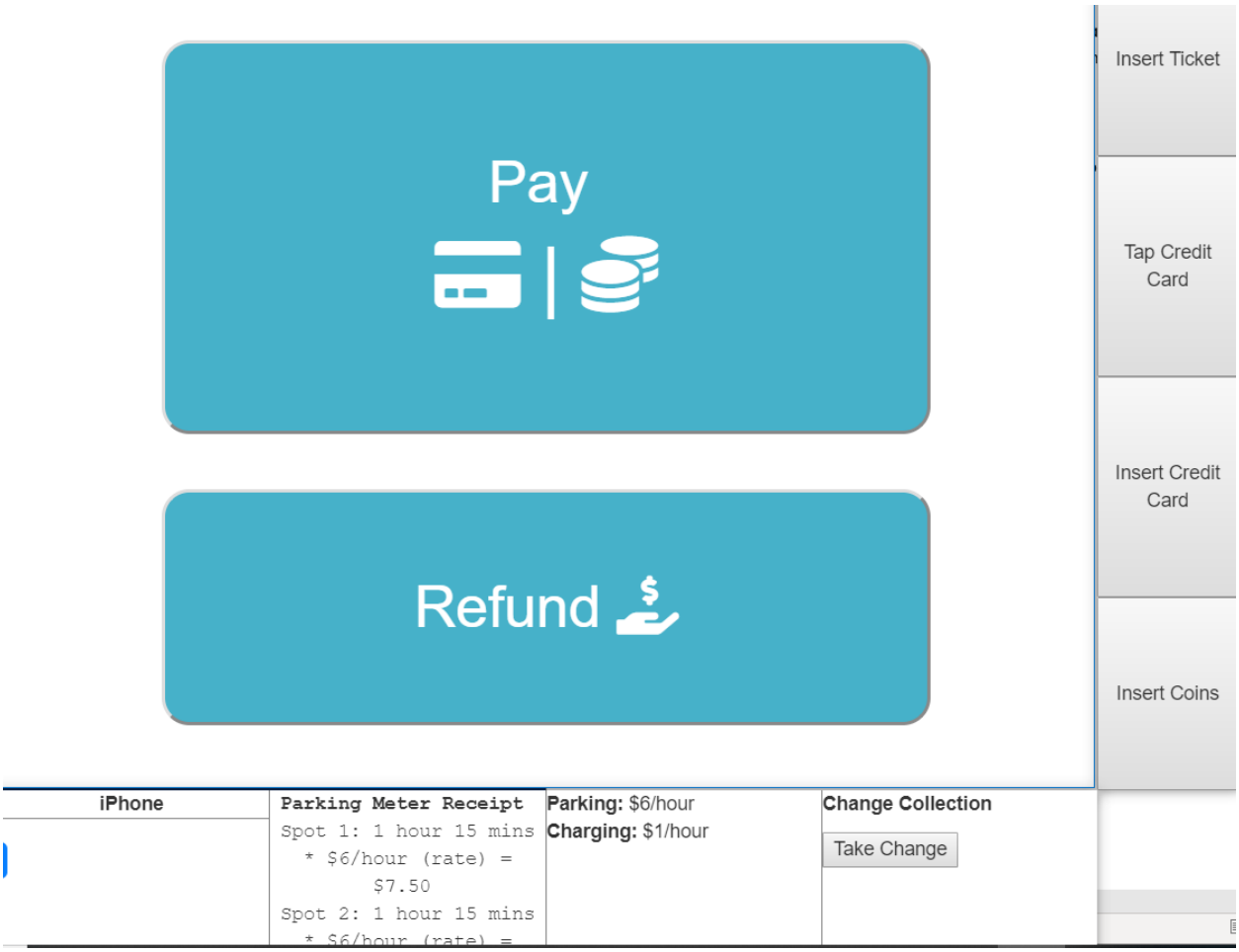


Figure 1 – "Home Screen". The user is able to either pay or ask for refund.

The primary concept behind our UI design is to make it easy to use. We do this by constraining the user to a minimal amount of actions per page, thereby making it easy to identify the affordance of each page. In addition, we have specifically made the text and buttons large. This increases accessibility to all users and helps users navigate through the pages through the touch screen. We have also added icons to key buttons. The "Home Page" (seen above in Figure 1) for example only includes two buttons. The user can either pay or ask for a refund. Each button is labeled "Pay" and "Refund". Also each button has an icon to let the user easily identify what each button does. The buttons are all blue, indented and look "clickable" making it easy for the user to navigate through menus.

While running the app, three windows will be opened. The center window is the largest and is the actual UI for the parking meter. This is what would be displayed to the user in the real parking machine. The window on the right represents all of the interaction items outside of the screen such as a coin slot, credit/debit machine, and an area to tap your credit/debit card. The bottom window represents aspects of the system which are technically outside the UI design of the parking meter. For example the received text message on a phone can be seen at the bottom left of Figure 1. The receipt, and also the

slot where users can get their change from can also be seen on the bottom window. Also, an external sign letting users know the parking rate is visible.

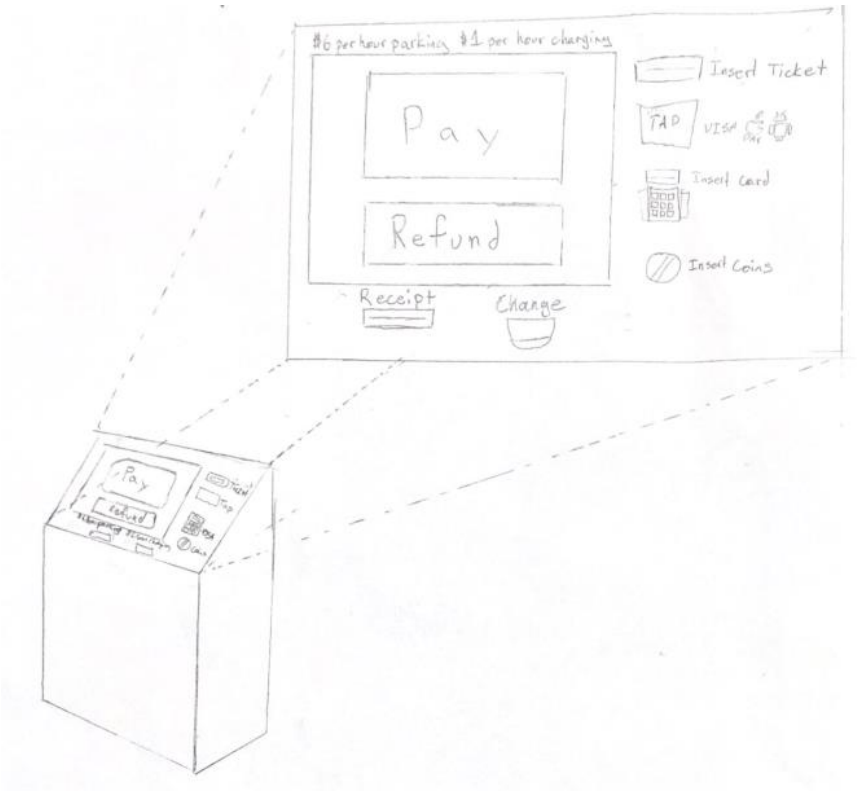


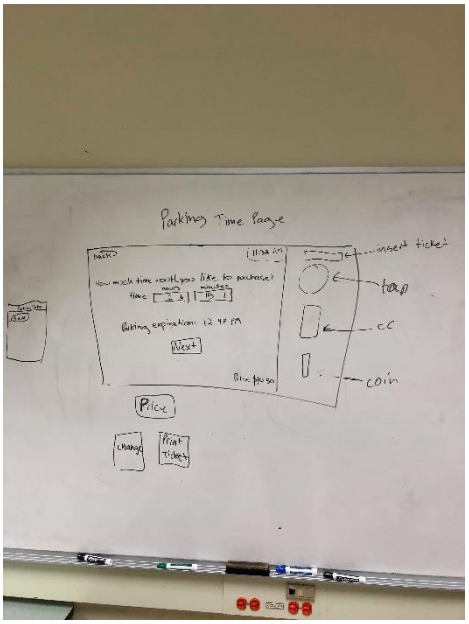
Figure 2 Parking Meter

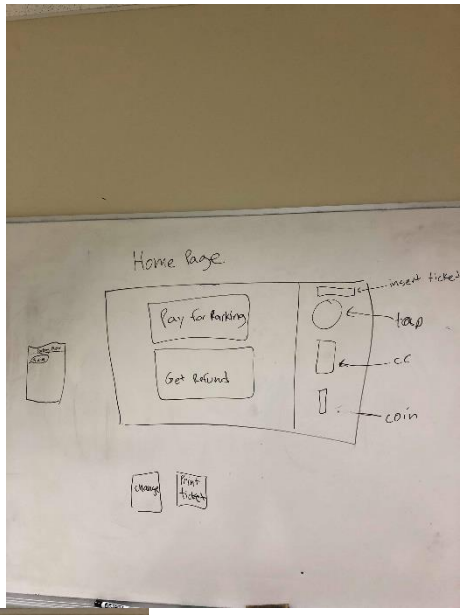
Additionally, we designed the look of the parking meter unit. This quick design illustrates how the parking meter would look like and shows all of the "physical" aspects such as the credit card pin, coin slot, where to insert your ticket, where change would be returned in the case of a cash payment, and where the receipts would be printed.

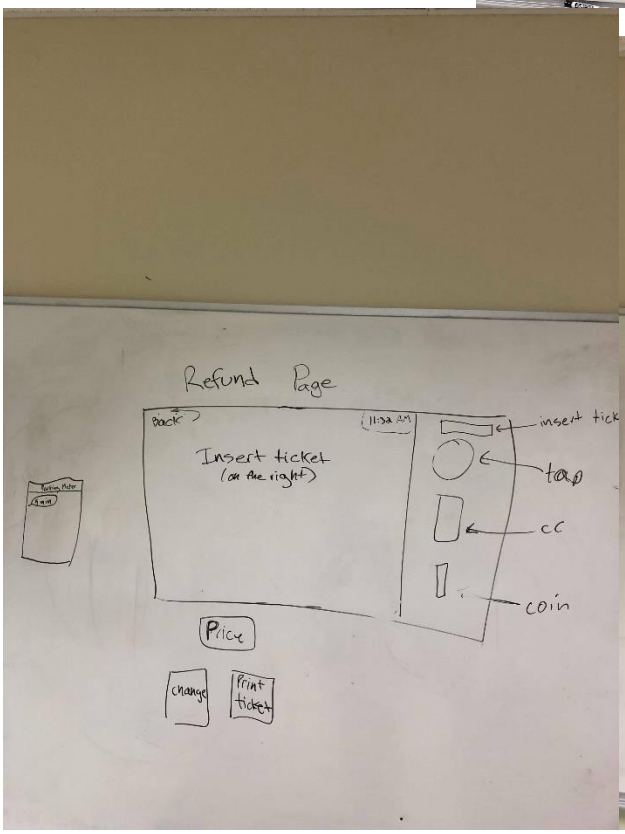
Run Instructions:

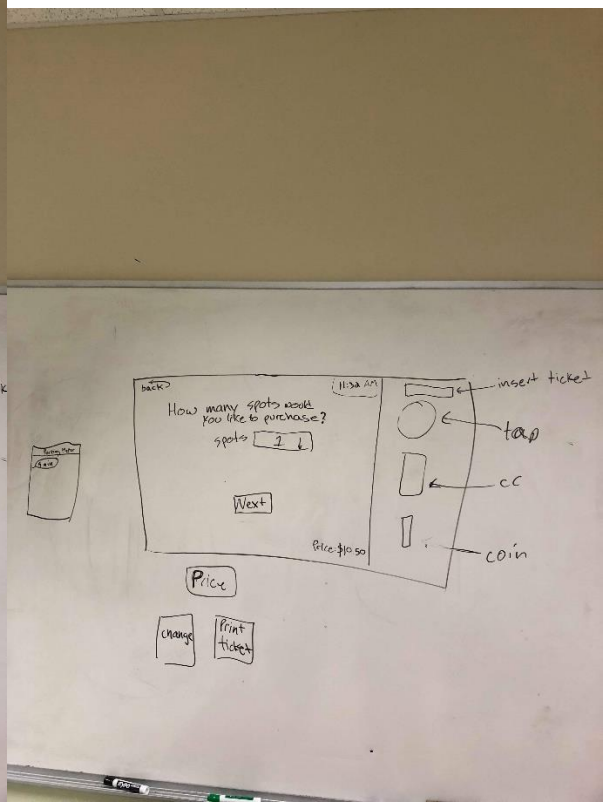
Run "ParkingMeter.exe" by double clicking on the .exe file or by running the command .\ParkingMeter.exe in command line.

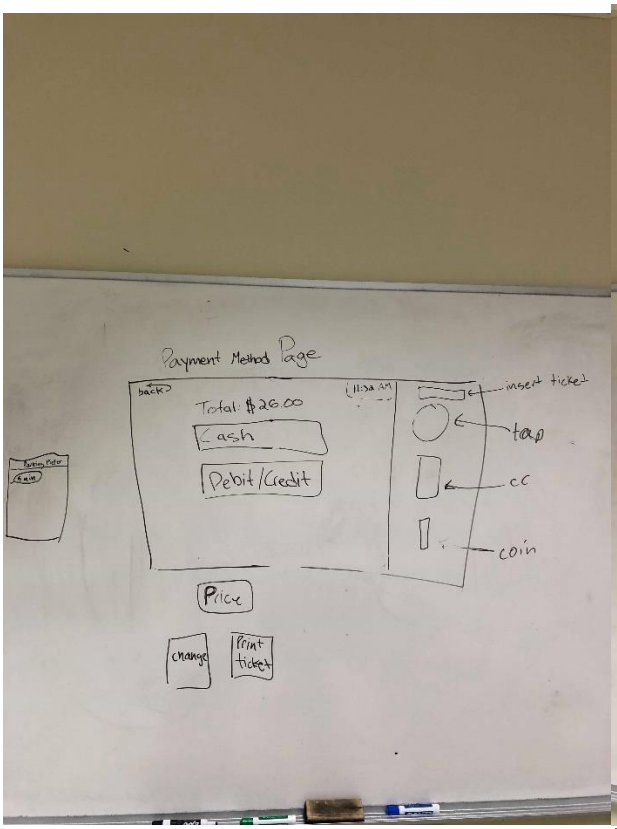
Pictures of our design process

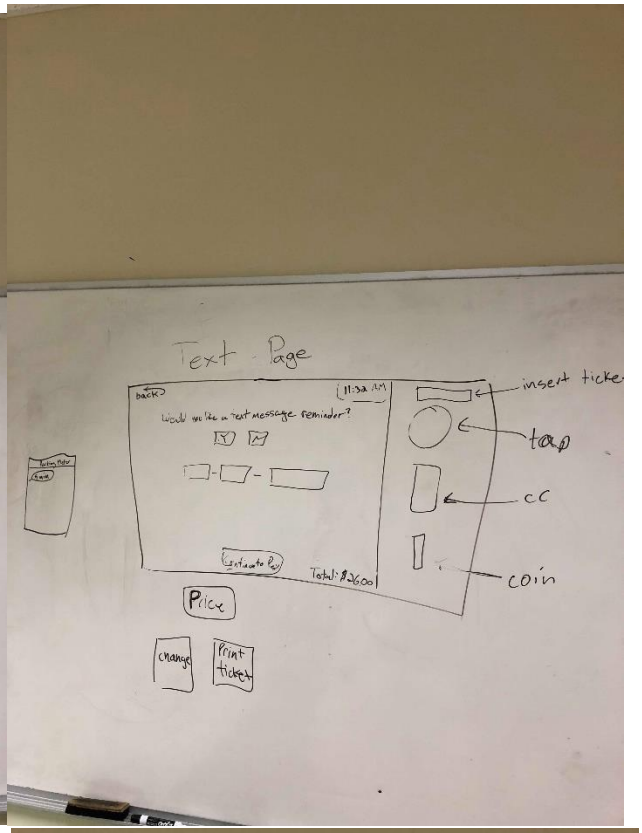


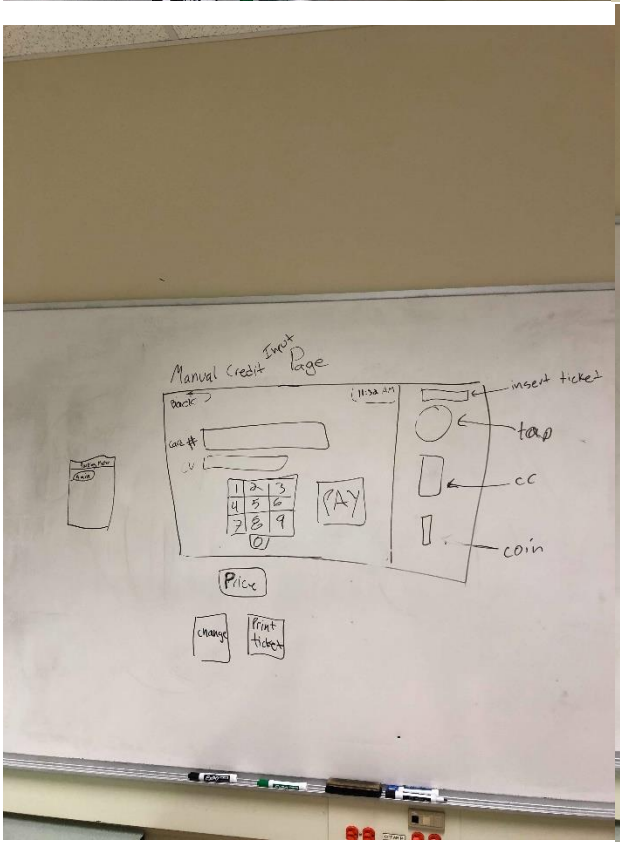


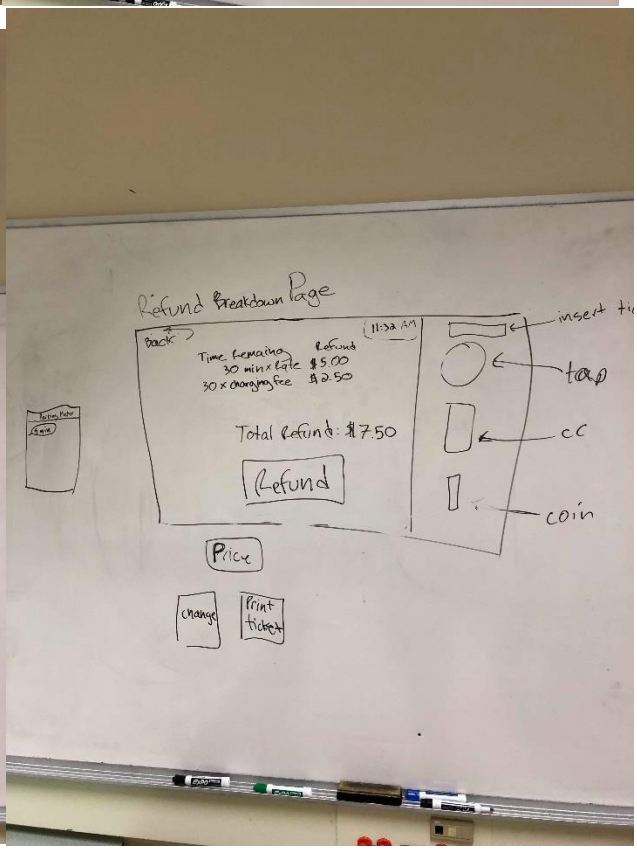


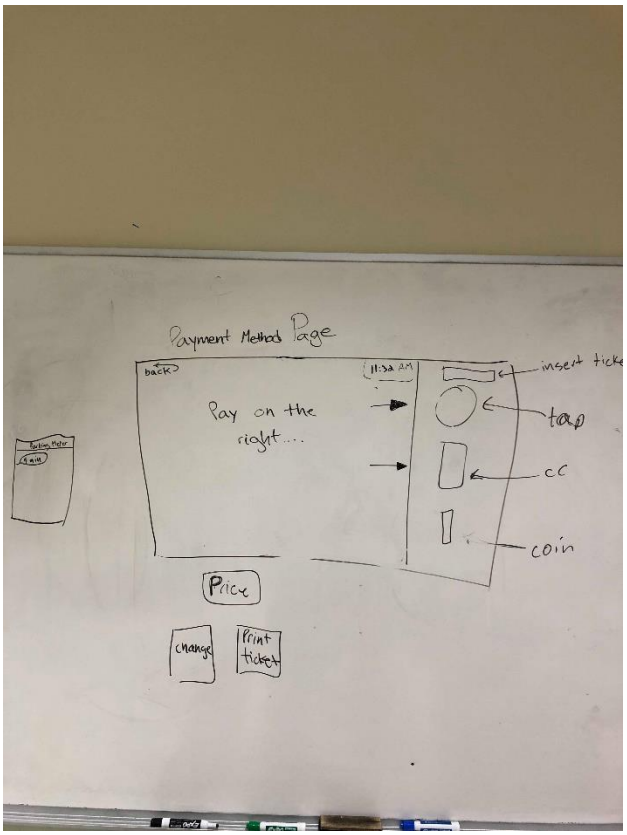


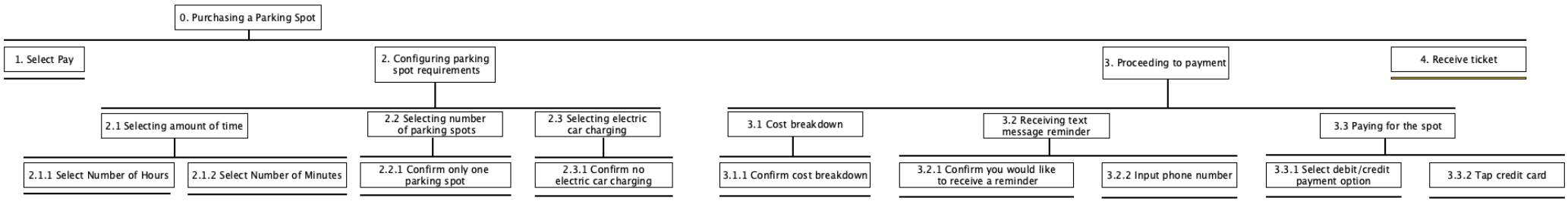

Payment Method Page
back
11:32 AM
Total: $25.00
Cash
Debit/Credit
insert ticket
tap
cc
coin
Price
change
Print ticket


Text Page
back
11:32 AM
Would you like a text message reminder?
Y
N
Continue to Pay
Total: $2.60
insert ticket
tap
cc
coin
Price
change
Print ticket


Manual Credit Input Page
back
11:32 AM
card #
1 2 3
4 5 6
7 8 9
0
PAY
insert ticket
tap
cc
coin
Price
change
Print ticket


Refund Breakdown Page
back
11:32 AM
Time Remaining
30 min x Rate $5.00
30 x charging fee $2.50
Refund
Total Refund: $7.50
Refund
insert ticket
tap
cc
coin
Price
change
Print ticket


Payment Method Page
back
11:32 AM
Pay on the right....
insert ticke
tap
cc
coin
Price
change
Print ticket


0. Purchasing a Parking Spot
1. Select Pay
2. Configuring parking spot requirements
3. Proceeding to payment
4. Receive ticket
2.1 Selecting amount of time
2.2 Selecting number of parking spots
2.3 Selecting electric car charging
3.1 Cost breakdown
3.2 Receiving text message reminder
3.3 Paying for the spot
2.1.1 Select Number of Hours
2.1.2 Select Number of Minutes
2.2.1 Confirm only one parking spot
2.3.1 Confirm no electric car charging
3.1.1 Confirm cost breakdown
3.2.1 Confirm you would like to receive a reminder
3.2.2 Input phone number
3.3.1 Select debit/credit payment option
3.3.2 Tap credit card

HTA