UTD Parking Enthusiasts

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Executive Summary

This system proposal will go in depth over the opportunities and threats of creating our application. Parking is one of the main concerns at the University of Texas at Dallas. Finding a parking spot on campus, can be time consuming and dangerous at times. In order to make parking faster and safer, we need to implement something that can provide accurate, real-time data. This application will be created in hopes of decreasing the amount of time a student uses to find a parking spot.

The main objective of this application is to provide students with a platform to record when they enter or exit a parking space. Other students may confirm ("thumbs up") if the space is empty or they can deny ("thumbs down") if they space is not empty. This in turn will provide students that are looking for a parking space with an accurate view of how many spots are open. This application will also make parking on campus a safer experience because students will know exactly which parking spaces are open and which aren't. Organizations on campus may also use the application to promote any upcoming events.

Throughout this system proposal, we will go over the functionalities and non-functionalities of our application. We will discuss our project scope, which will clearly define the main purpose of our application. We will also cover the expected value of our project, where we will talk about how we foresee our project will turn do once implemented. Lastly, we will go over some of the constraints we will face once we start building our project.

Background and Justification:

The current state of UTD parking is very rough and inconvenient. There is no system that allows drivers to see the available parking spots in every lot on a mobile device. Only parking garages have a capacity counter, which is only on display right outside of the garage. There are no outdoor lots on campus that display parking availability.

The proposed system will allow drivers to use a mobile application to see the approximate parking space availability of all parking lots at UTD at any given time. This will greatly reduce the time drivers will need to find a spot, as they will only be going to lots that have open spaces. This will be much more efficient than every driver checking for spots in a lot that may be full, only to go to a different lot anyway – this is the current parking situation at UTD.

Functionality:

The application will rely on a user self-reporting framework similar to that of the popular driving app Waze. Drivers will report an approximate parking availability of a lot (in a simplified percentage form), and these reports will be voted up or down to confirm or deny the report in real time. Based on these reports, the app will aggregate data to determine a lot's approximate parking availability while maintaining accuracy based on report voting. Drivers will be able to view the approximate availability of every lot before they even get to campus, but will only be able to make reports once they are on campus.

Another functionality of the app will be advertisements. Because the app will be primarily used by students and faculty, the app will be first open to student organizations and other on-campus programs for advertising. These organizations will pay a predetermined fee for a banner advertisement on the app.

A third function of the app will be overall data tracking over time. After about a year of tracking parking data, the app will be able to show average parking capacities of a lot at a given time. Using this data, a user could look at predicted parking availability for a given time the next day, in order to plan out their schedule in advance.

Project Scope:

The scope of the project involves both the schedule and requirements of the project, which will be explained in more detail later in the proposal. The general time frame for the project will be about 1 year from when the proposal is approved. The project will be limited to the UT Dallas campus until it is proven capable to be used at other campuses.

Functional and Non-Functional Requirements:

The functional requirements for the project are as follows: storing user location information, storing and displaying parking space availability information, user ability to mark parking spots, accepting user input, confirmation functionalities for users, and recording forecasting data for parking trends.

The non-functional requirements for the project are as follows: iOS and Android capabilities (OPERATIONAL), data refreshing capabilities (PERFORMANCE), user login credentials (SECURITY), and multiple language capabilities (CULTURAL/POLITICAL).

Expected Value: The application will not be expected to be profitable during its first semester. Instead, this will be a proof of concept, where users will be asked to rate the app on its features as well as report on how often they use the app. These results will be taken into consideration and used to update the app for a new version for its second semester of use. After this, an inflow of advertisement revenue will be expected to begin. Monetary projections for this are still processing, but a ballpark estimate would be near $10,000 for a semester for advertisement revenue.

Constraints: Some potential issues with the project include gaining support from UTD. While this is definitely feasible, the application does hinge on getting approval from the University. Another potential issue is security, as there will be location tracking with the app, as well as a student ID and password login to use the app. A solution to this will be integrating through the UTD login supported by the campus, allowing a much more secure connection than solely a third party app. A third issue is incorrect reporting, which should hopefully be solved through the upvoting/downvoting process that will exist for all reports.

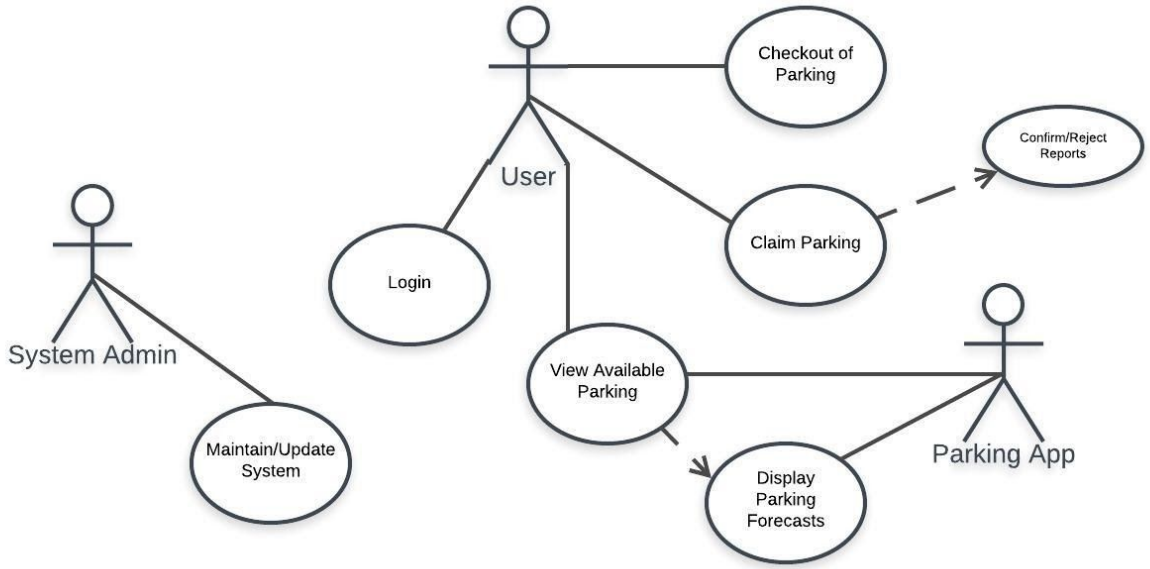
Activity Name	Work Time (Days)	Date Start	Date End	Team Member Committal
Planning 1.0				
System Request 1.1	1	8/26/18	8/26/18	Ashwin Vaithianathan, Ashr Khan
Feasibility analysis 1.2	3	8/26/18	8/28/18	Ashr Khan, Maria Cruz
System Approval 1.3	1	8/29/18	8/29/18	Professor Taimur
Scope Planning 1.4	2	8/29/18	9/1/18	Oliver Olvera, Robert Khuu
Project Proposal	3	9/1/18	9/4/18	Ashr Khan, Ashwin Vaithianathan
Analysis 2.0				
Analysis Plan 2.1	1	9/13/18	9/13/18	Robert Khuu, Oliver Olvera
Functional Reqs 2.2	3	9/25/18	9/28/18	Ashr Khan, Maria Cruz
Class Diagrams 2.3	2	9/28/18	9/30/18	Oliver Olvera, Ashwin Vaithianathan
Process Models 2.4	2	9/30/18	10/2/18	Ashr Khan, Oliver Olvera
Use Case Models 2.4.1	2	10/2/18	10/4/18	Oliver Olvera, Maria Cruz, Robert Khuu
Use Case Descriptions 2.4.2	2	10/2/18	10/4/18	Oliver Olvera, Ashr Khan, Ashwin Vaithianathan
Object Behavior Model 2.5	4	10/16/18	10/20/18	Maria Cruz, Robert Khuu
Design 3.0				
Design Architecture Planning	2	10/30/18	11/1/18	Oliver Olvera, Ashr

3.1				Khan
Interface Design 3.2	2	11/1/18	11/3/18	Ashwin Vaithianathan, Ashr Khan, Oliver Olvera
Software Design 3.3	3	11/3/18	11/6/18	Ashwin Vaithianathan, Robert Khuu, Maria Cruz
Controls 3.4	2	11/6/18	11/8/18	Ashr Khan, Maria Cruz
Test Cases 3.5	1	11/8/18	11/9/18	Maria Cruz, Robert Khuu
Implementation 4.0				
Implementation Plan 4.0				Robert Khuu, Oliver Olvera
Coding 4.1	10	12/1/18	12/11/18	Ashwin Vaithianathan, Maria Cruz
Product Pitch 4.2	4	12/15/18	12/19/18	Ashr Khan, Oliver Olvera
User Training 4.3	14	12/20/18	1/4/18	Ashwin Vaithianathan, Ashr Khan, Maria Cruz
Maintenance 4.4	N/A	1/4/18	N/A	Ashwin Vaithianathan, Ashr Khan, Maria Cruz, Oliver Olvera, Rober Khuu

Meeting Minutes

Meeting Number	Meeting Date	Time Start	Time End	Members Present	Notes
1	8/28	5:00	6:45	Maria, Ashr, Ashwin, Oliver, Robert	-Project selection -Choosing who our target market will be -Milestone I
2	9/4	5:00	6:00	Maria, Ashr, Ashwin, Oliver, Robert	-Figured out how we want the application to work -Decided on project scope
3	9/25	5:00	6:00	Maria, Ashr, Ashwin, Oliver, Robert	-Determined who were the different users -Determined how much access each user has within the application
4	10/2	5:00	6:00	Maria, Ashr, Ashwin, Oliver	-Milestone II- System Proposal -Developed project schedule

Use Case Diagram



Use Case Descriptions

Use Case 1: Login

Use Case Name: Login	ID: 1	Importance Level: High
Primary Actor: User	**Use Case Type:** Essential, Internal	
Stakeholders and Interests: User/Student - Login to the app for use.		
Brief Description: This use case describes how users login to use the app and start the parking process		
Trigger: User's need to park at UTD.		
Subflows: *Optional, NONE*		
Normal Flow of Events: **1)** User opens the application from their phone. **2)** User enters netID. **3)** User enters password. **4)** User gains access to app.		
Alternate/Exceptional Flows: 2**a)** Incorrect NetID. 1. Please enter a valid NetID. 3**a)** If passwords don't match. 1. Enter the correct password.		

Use Case 2: View Available Parking

Use Case Name: View Available Parking	**ID: 2**	**Importance Level: High**
Primary Actor: User	**Use Case Type:** Essential, Internal	
Stakeholders and Interests: User/Customer – View available parking and forecasts.		
Brief Description: This use case describes how users view the available parking and the forecasted parking based on previous trends.		
Trigger: • User has logged in. • User has selected to view available parking.		
Subflows: ***Optional, NONE***		
Normal Flow of Events: **1)** User clicks View Available Parking. **2)** User selects parking lot on campus map. **3)** App shows number of available parking spaces.		
Alternate/Exceptional Flows: 1**a)** Display Parking Forecast. **1.** User clicks Display Parking Forecasting . **2.** User selects parking lot on campus map. **3.** User selects the desired day of parking forecast. **4.** App displays the expected traffic/availability of parking spaces		

Use Case 3: Claim Parking

Use Case Name: Claim Parking	**ID: 3**	**Importance Level: High**
Primary Actor: User	**Use Case Type:** Essential, Internal	
Stakeholders and Interests: User/Customer – Claim available parking.		
Brief Description: This use case describes how users can claim an available parking space through the app.		
Trigger: User parks in an available parking space and needs to register it.		
Subflows: *Optional, NONE*		
Normal Flow of Events: **1)** User finds open parking space. **2)** User enters parking space number into the app to claim it. **3)** System is updated by closing availability for this parking space until student checks out.		
Alternate/Exceptional Flows: **1a**) "Available Space" is unavailable. 1. User downvotes the false information for future users to be aware of. 2. System registers a downvote for the previous user who reported false information.		

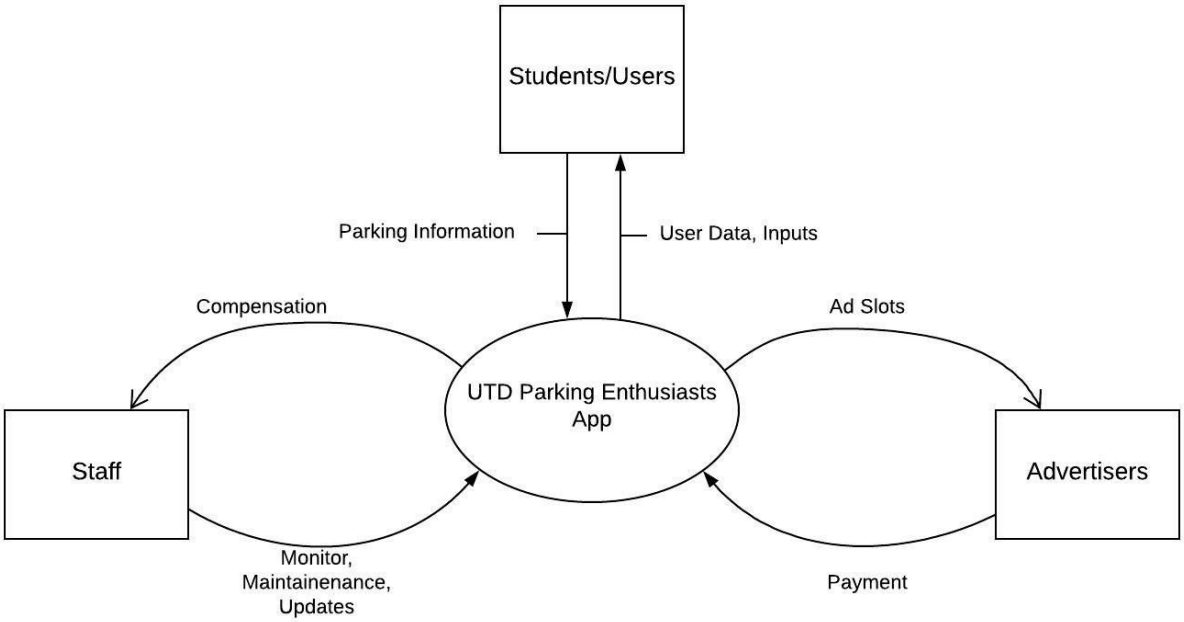
Use Case 4: Checkout of Parking

Use Case Name: Checkout of Parking	**ID: 4**	**Importance Level: High**
Primary Actor: User	**Use Case Type:** Essential, Internal	
Stakeholders and Interests: User/Customer – Checkout of parking so others users will be aware.		
Brief Description: This use case describes how users are able to checkout of their parking space when they leave.		
Trigger: User leaves parking and is required to checkout.		
Subflows: *Optional, NONE*		
Normal Flow of Events: **1)** User opens app again. **2)** User clicks on the Checkout option. **3)** User confirms checkout. **4)** System updates the parking space as Available.		
Alternate/Exceptional Flows:		

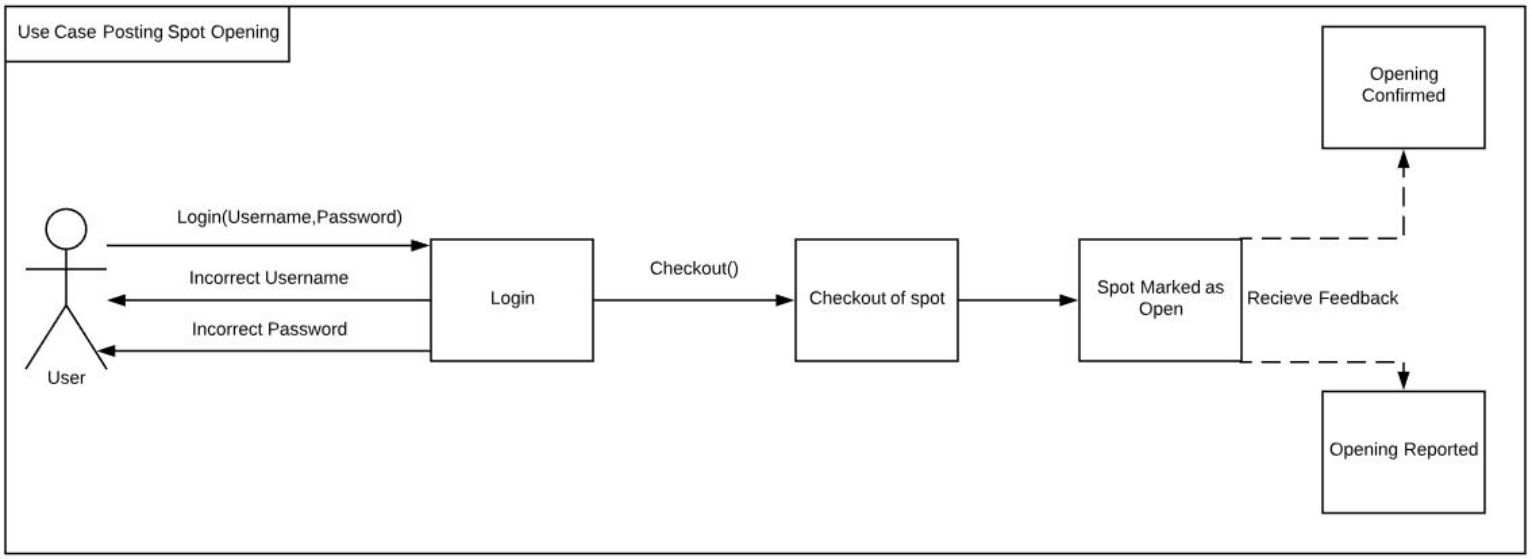
Use Case 5: Maintain System

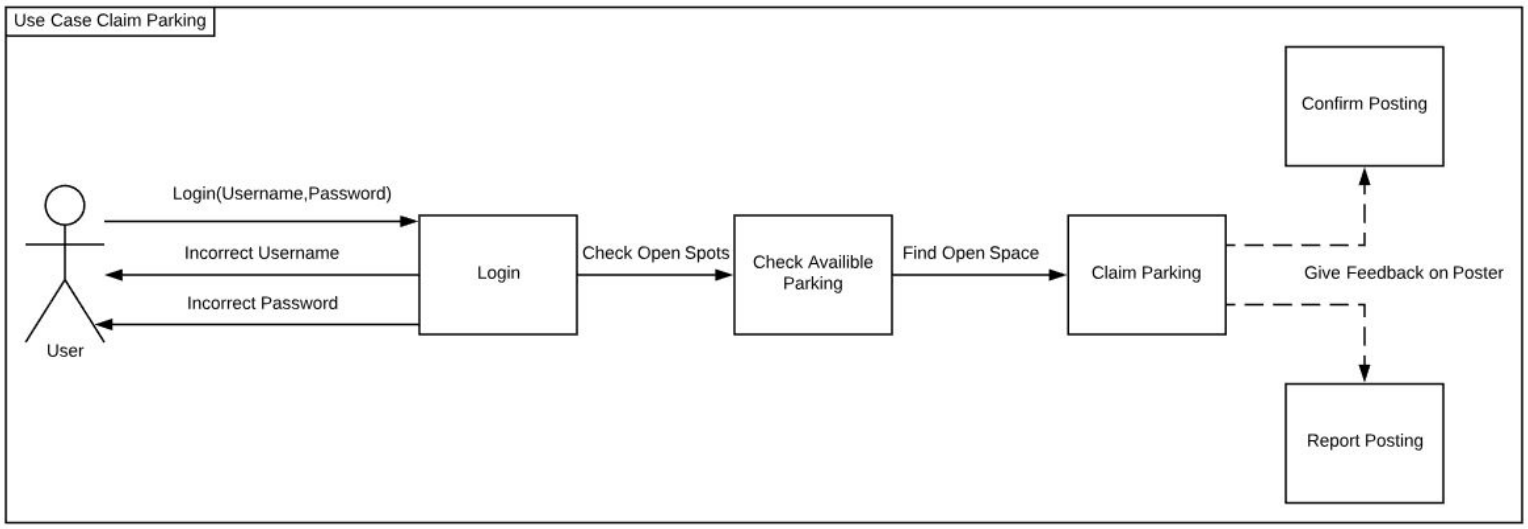
Use Case Name: Maintain System	**ID: 5**	**Importance Level: High**
Primary Actor: System Admin	**Use Case Type:** Essential, Internal	
Stakeholders and Interests: System Administrator – Monitor, maintain, and update the application.		
Brief Description: This use case describes how System Administrators are able to access their role to monitor, maintain, and update the system.		
Trigger: Desire to maintain application		
Subflows: *Optional, NONE*		
Normal Flow of Events: **1)** Admin enters username **2)** Admin enters password **3)** Admin selects submit **4)** Successful Administration Login **5)** Admin can view files, table, accounts, etc.		
Alternate/Exceptional Flows: 4a) Failed login. 1. Please re-enter password or username.		

Context Diagram

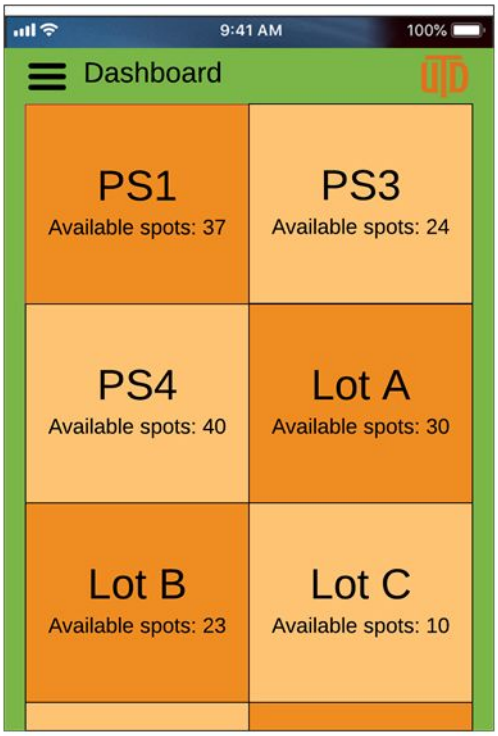


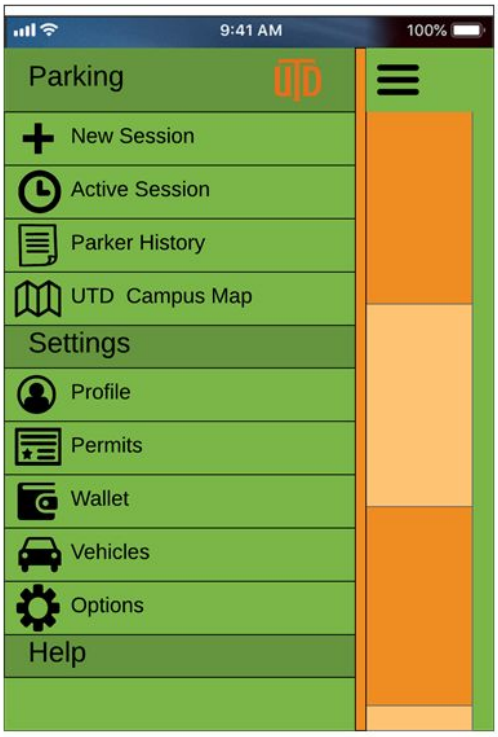
Communication Diagrams:

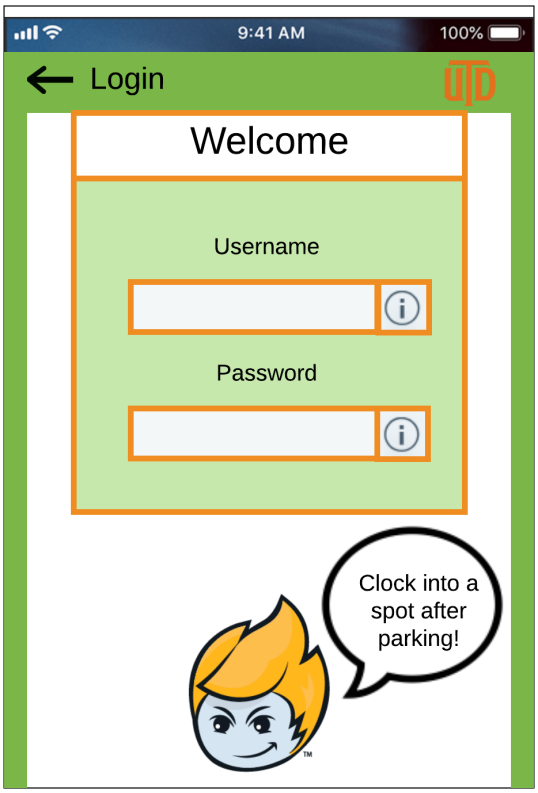


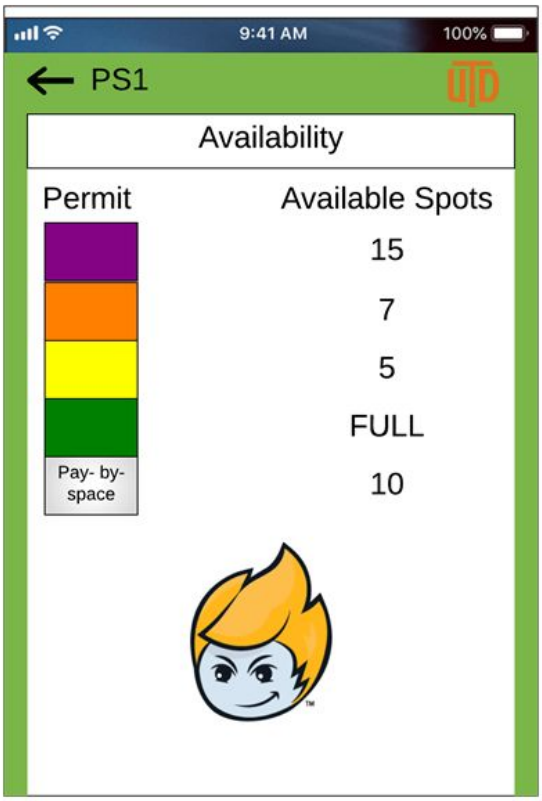


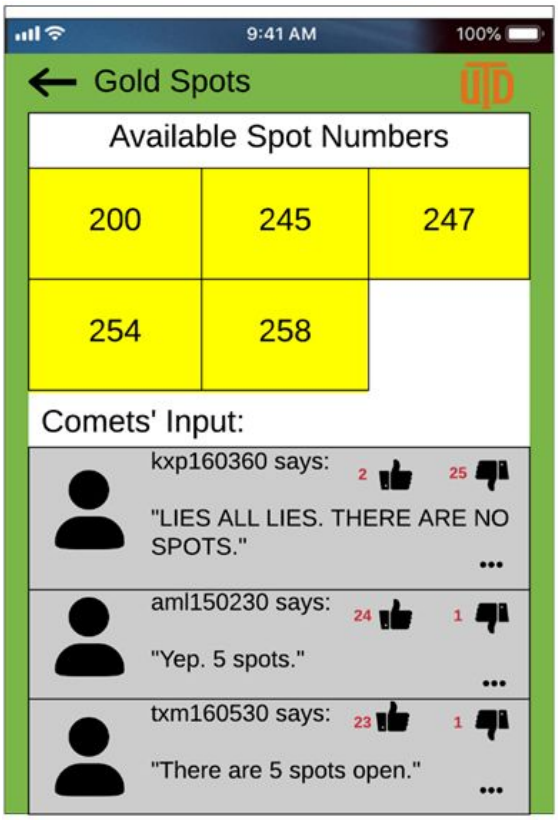
User Interface Design:



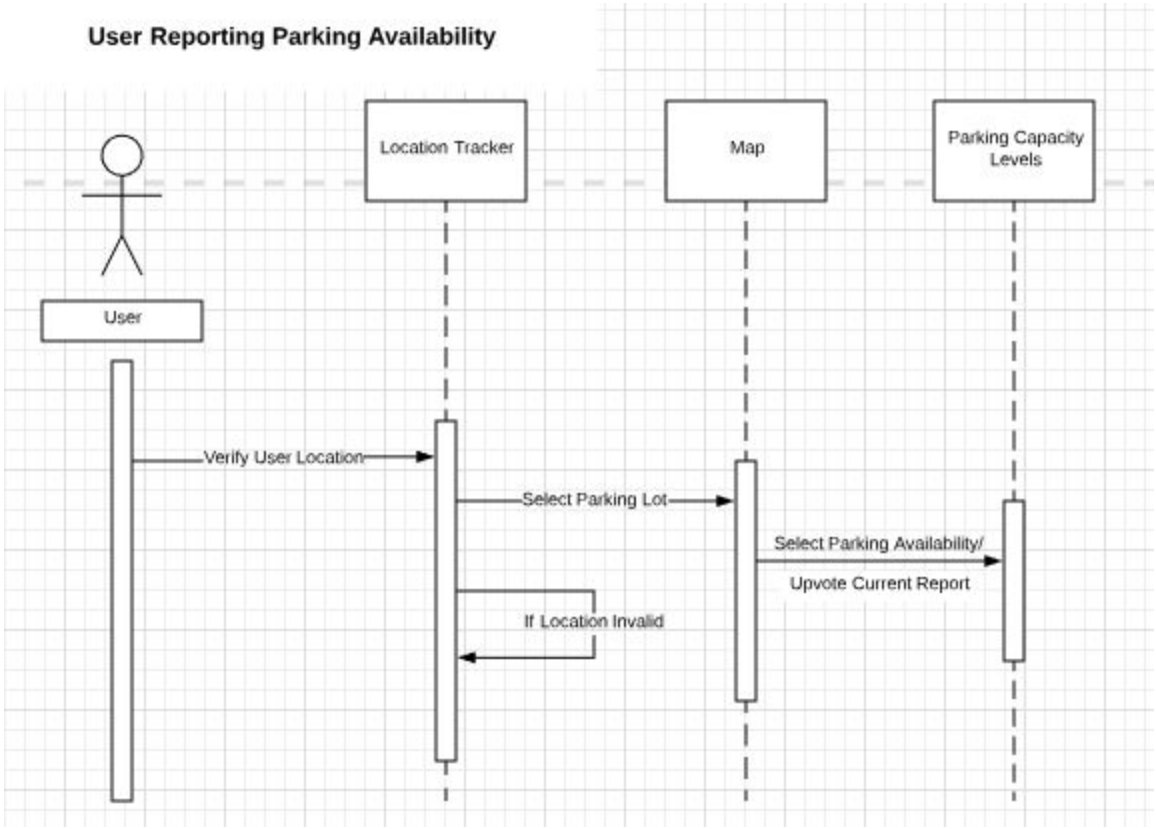


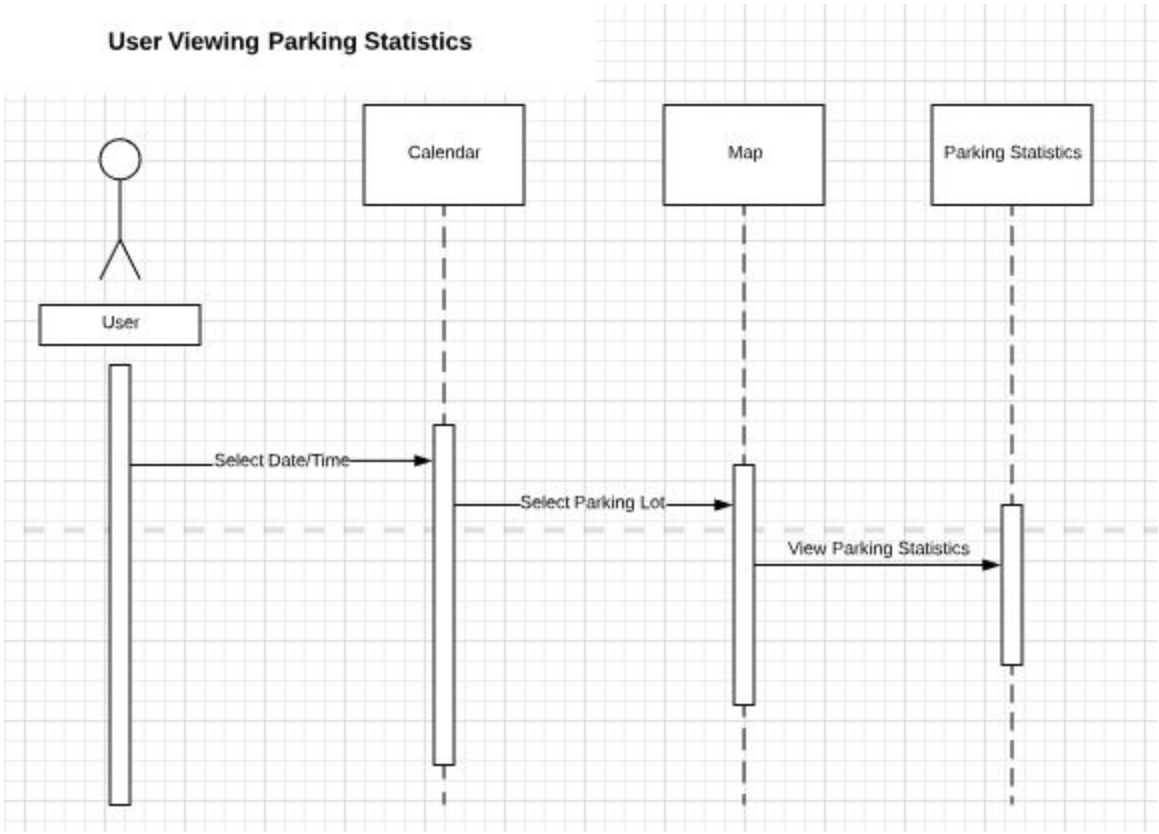

9:41 AM
100%
Login
Welcome
Username
Password
Clock into a spot after parking!


9:41 AM
100%
PS1
Availability
Permit
Available Spots
15
7
5
FULL
10
Pay- by- space


9:41 AM
100%
Gold Spots
Available Spot Numbers
200
245
247
254
258
Comets' Input:
kxp160360 says:
2
25
"LIES ALL LIES. THERE ARE NO SPOTS."
aml150230 says:
24
1
"Yep. 5 spots."
txm160530 says:
23
1
"There are 5 spots open."

Sequence Diagrams




User Viewing Parking Statistics
Calendar
Map
Parking Statistics
User
Select Date/Time
Select Parking Lot
View Parking Statistics

Class Diagram