CMSC 345

Software Design and Development

UMBC-CMSC 447 Section 2 Team 4
Team Awesome

Planes for Hire

System Requirements Specification

Client: John Winder

Member: Sundar Sekar <ssekar1@umbc.edu>, Tam Tran <tamtran1@umbc.edu>,
William Cahill <wcahill1@umbc.edu>, Roberto Melgar <rmelgar1@umbc.edu>,
Du Nguyen <du2@umbc.edu>

2/12/2015

[Planes for Hire]
System Requirements Specification

Table of Contents

1. **Introduction**

1.1 Purpose of This Document

This document is designed to explain the features of our renting plane web application, its functions, and the conditions required for operation. The intended audience is the the customer, John Winder and ourselves, the development team.

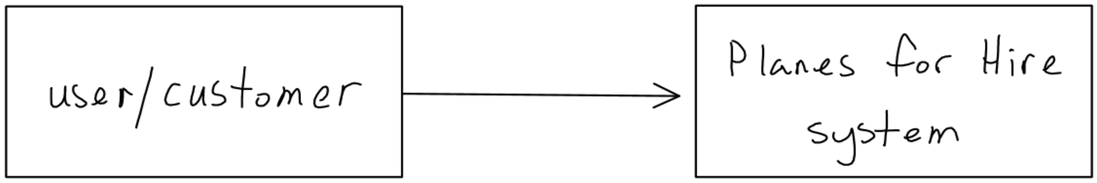
1.2 Purpose of the Product

This application is designed to let customers rent out planes and travel to anywhere they want to in the the United States of America. Renting and travelling by plane will be simplified by the webserver, as it keeps track of who rents a plane, where his or her destination is, and what planes are available based on the user's location.

1.3 Product Scope

The Planes for Hire application consists of sixteen use cases including: Google Maps API, clickable pins, planes, airports, user login, account protection, avatars for users, search function, late penalties, and many more. Please refer to figures 1-17 below for further understanding of actions available to users.

Figure 1. High level use case context diagram overview



1) google maps
2) clickable pins
3) 10 diffrent airports
4) 30 airplanes
5) user login
6) account protection
7) avatar
8) search function
9) late penalties
10) chek in
11) chek out
12) user profile
13) administrator user
14) administrator page
15) wainting list
16) user registration

Figure 2. Use case 1, Google Maps

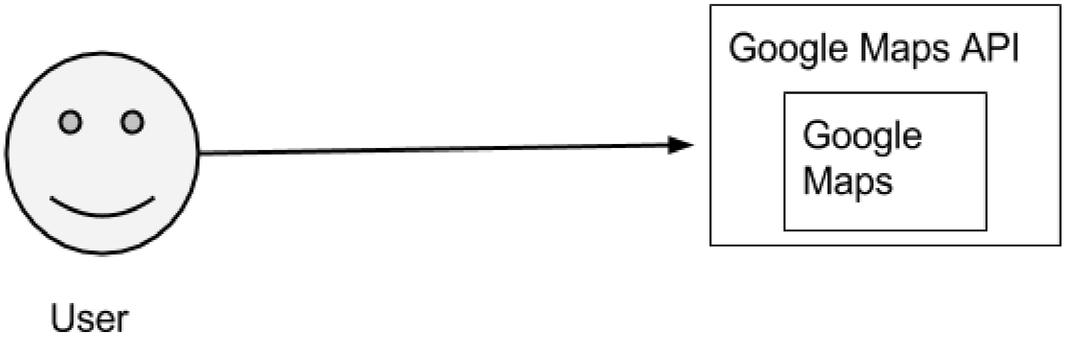


Figure 3. Use case 2, Clickable Pins

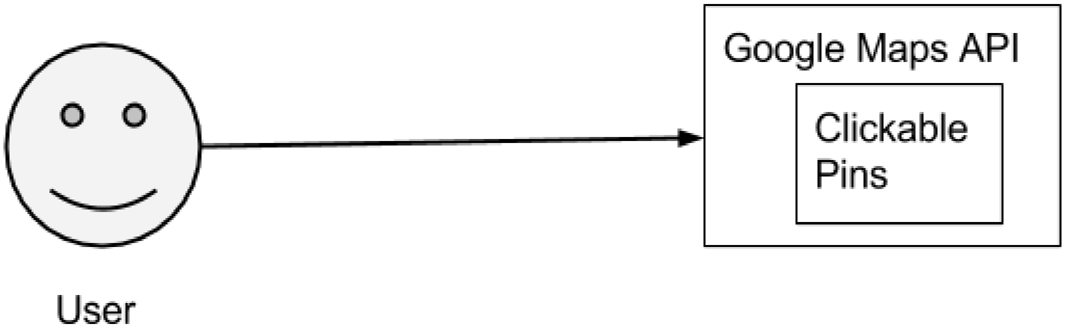


Figure 4. Use case 3, Airport

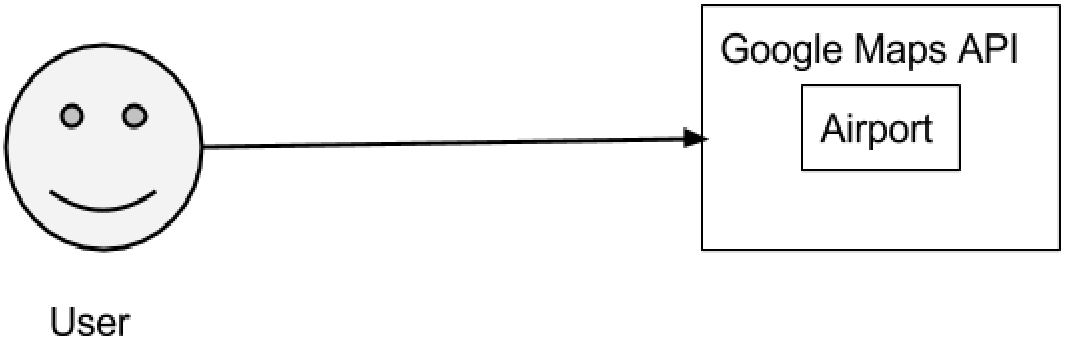


Figure 5. Use case 4, Airplane

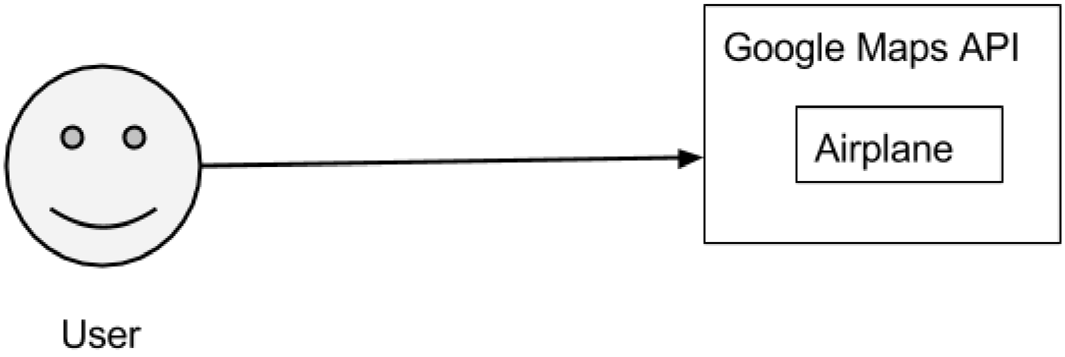


Figure 6. Use case 5, User Login

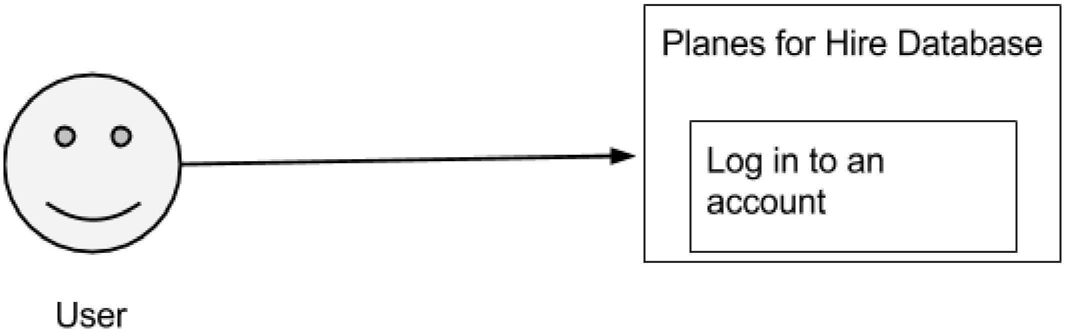


Figure 7. Use case 6, Account Protection

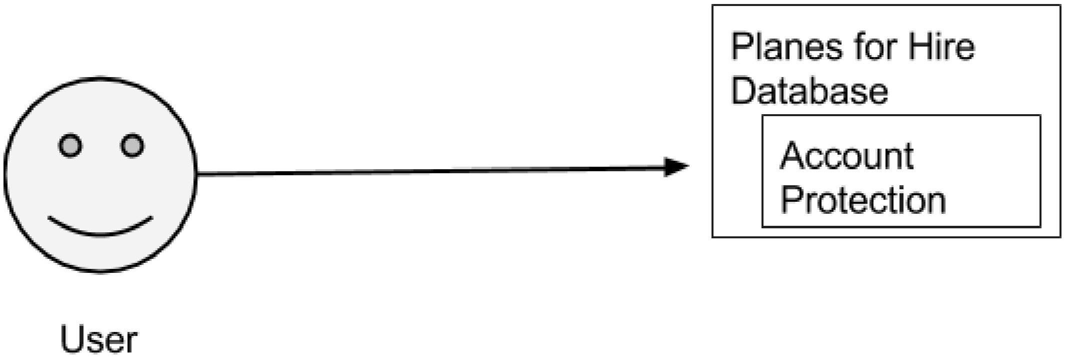


Figure 8. Use case 7, Profile Picture

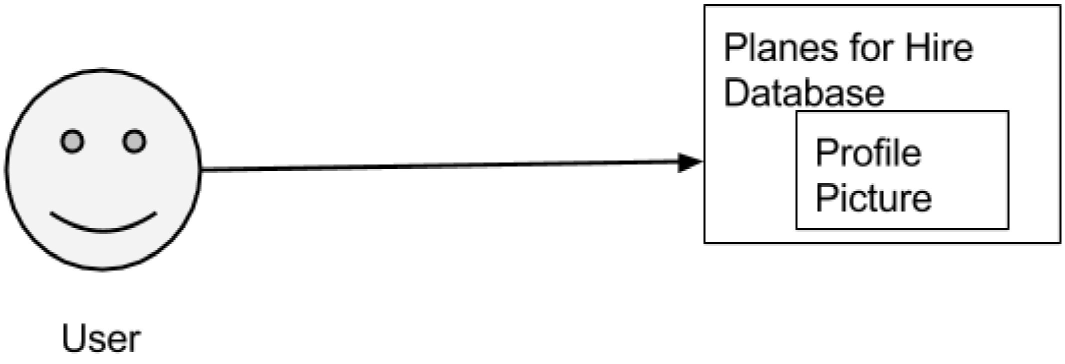


Figure 9. Use case 8, Search Function

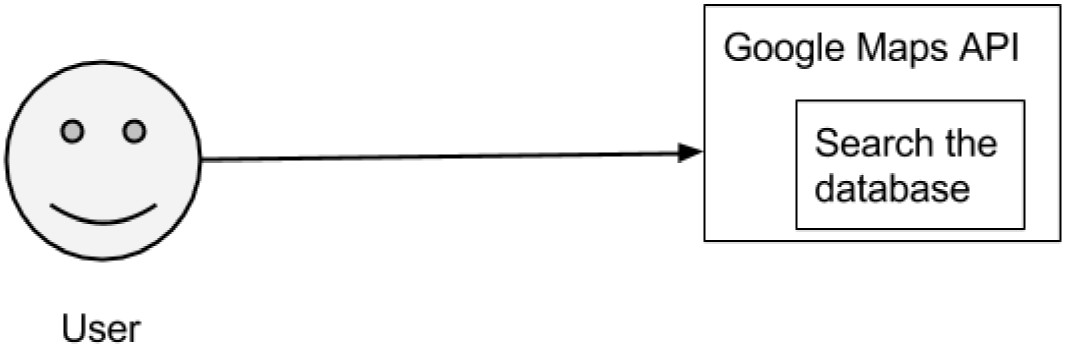


Figure 10. Use case 9, Late Penalties

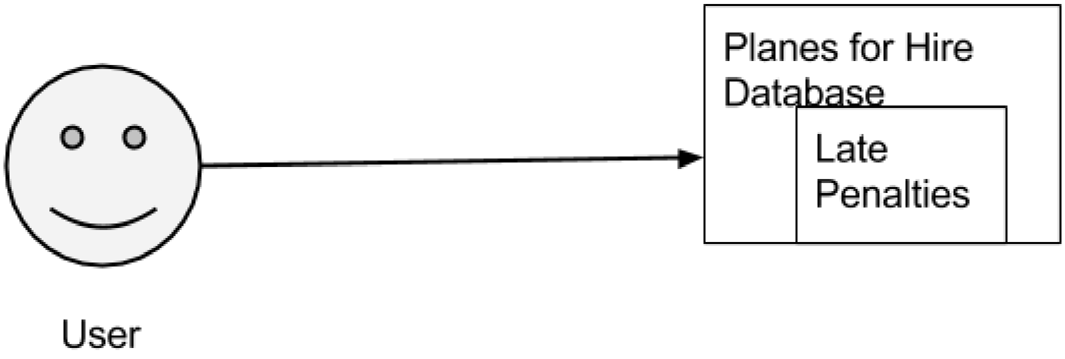


Figure 11. Use case 10, Check In

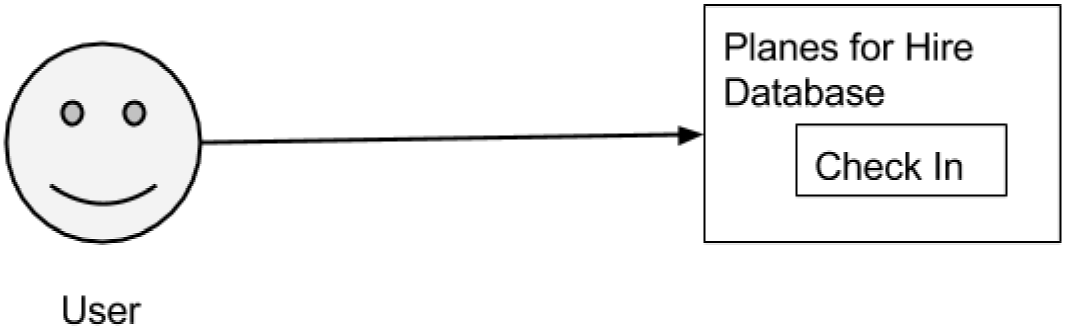


Figure 12. Use case 11, Check Out

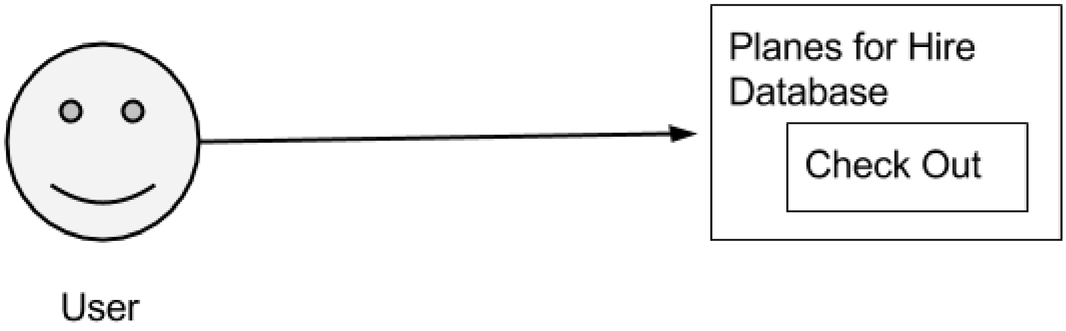


Figure 13. Use case 12, User Profile Page

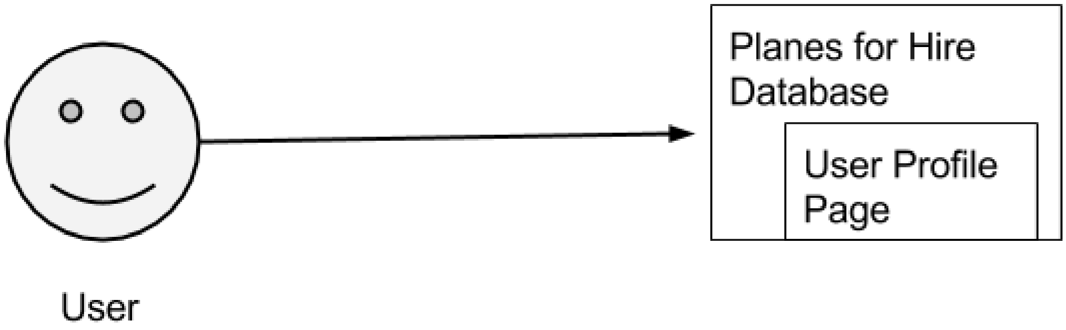


Figure 14. Use case 13, Administrative User

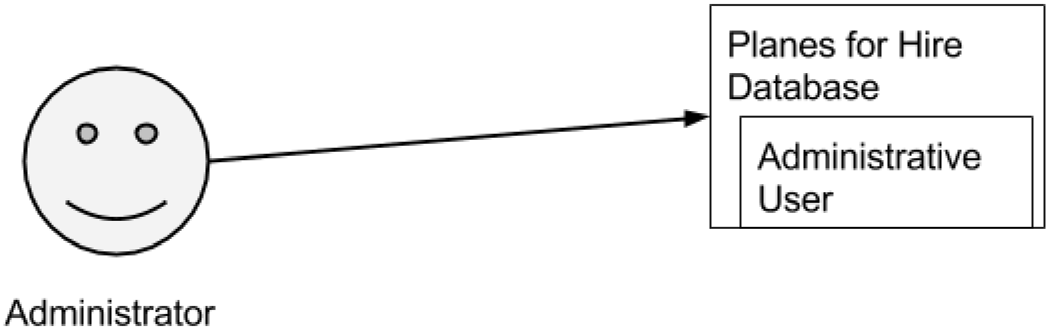


Figure 15. Use case 14, Administrative Page

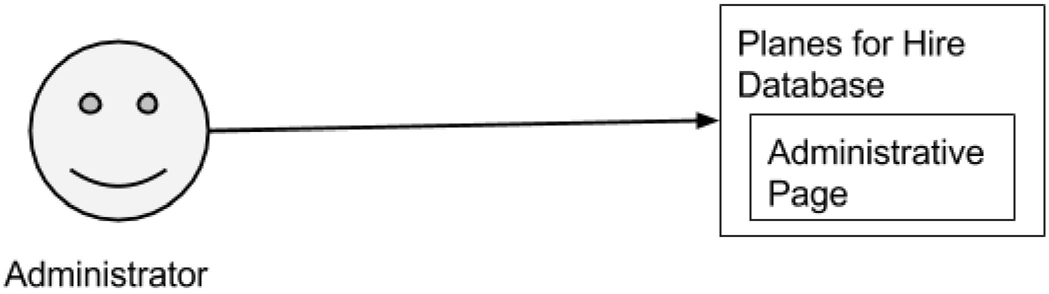


Figure 16. Use case 15, Waiting List

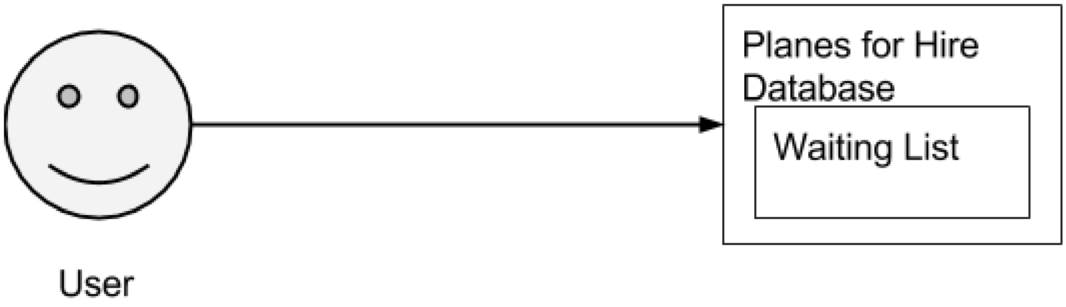
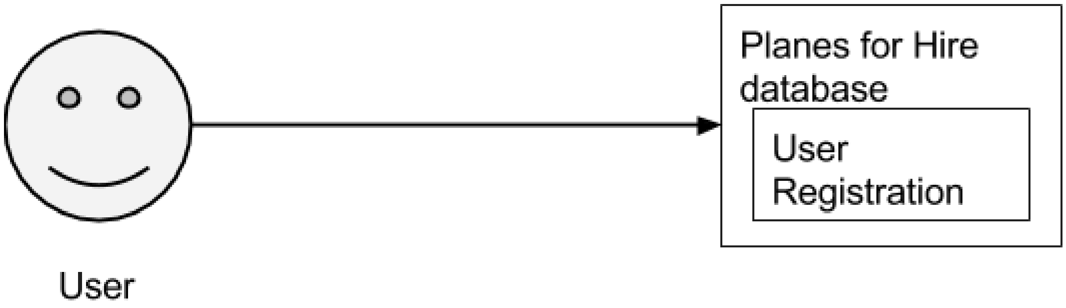


Figure 17. Use case 16, User Registration



2. Functional Requirements

Number	1	
Name	Google Maps	
Summary	A top view of locations of airports near the user. It allows the user to see the time and distance to their destination.	
Priority	5	
Preconditions	User must be able to search for airports near them.	
Postconditions	It should show flight path for user selected destination	
Primary Actor	User	
Secondary Actors	Google maps server	
Trigger	Open web browser	
Main Scenario	**Step**	**Action**
	1	Open the web browser
Extensions	**Step**	**Branching Action**
		N/A
Open Issues	Server down, Internet issues	

Number	2	
Name	Clickable pins	
Summary	Drop down pins for user selected source and destination	
Priority	4	
Preconditions	should drop a pin for the user selected source.	
Postconditions	Highlight the route of the destination where the two endpoint should have a drop pins	
Primary Actor	user	
Secondary Actors	Server	
Trigger	Search button.	
Main Scenario	**Step**	**Action**
	1	Search source and destination
	2	Click pins
Extensions	**Step**	**Branching Action**
		N/A
Open Issues	Server problem, Connectivity issues	

Number	3	
Name	Making planes	
Summary	Making 30 planes using an object class to simulate rentable planes	
Priority	1	
Preconditions	There must be an airport for the planes to be in	
Postconditions	There will be planes that are “flyable” and traceable.	
Primary Actor	The client	
Secondary Actors	< other systems that are relied upon to accomplish the use case >	
Trigger	Client rents a plane	
Main Scenario	**Step**	**Action**
	1	User selects nearest airport
	2	User selects destination
	3	User takes a plane
Extensions	**Step**	**Branching Action**
	1a	N/A
Open Issues	If there is one plane at the airport then second user at the airport won’t be able to use the app.	

Number	4	
Name	Making airports	
Summary	Making 10 airports that will simulate real locations where the planes can land.	
Priority	2	
Preconditions	There must be a location	
Postconditions	Planes can arrive and leave the airports	
Primary Actor	Planes leaving and arriving	
Secondary Actors	< other systems that are relied upon to accomplish the use case >	
Trigger	When a user searches for a flight path before arriving at the starting airport.	
Main Scenario	**Step**	**Action**
	1	User searches for a location to fly to
	2	The app tells users the nearest airport to fly from
	3	User drives to airport
Extensions	**Step**	**Branching Action**
	1a	If the user selects an area where there are no airports then the app will display an airport closest to the user.
Open Issues	N/A	

Number	5	
Name	User Login	
Summary	Having an easy to access login system incorporating a username and password	
Priority	4	
Preconditions	There must be a visible login/signup icon at the top right of the screen. User should be able to put in his/her username and password.	
Postconditions	User will be able to check in and check out planes after signing in.	
Primary Actor	Users of the website	
Secondary Actors	Database that keeps record of usernames and passwords. JSON was suggested to be a potential alternative.	
Trigger	Clicking on sign-in/login link and inputting username and password.	
Main Scenario	**Step**	**Action**
	1	User clicks on sign-in/login at top right corner of screen.
	2	User inputs valid username/email and password
	3	User clicks sign-in/login button, and if all goes well, enters the main site.
Extensions	**Step**	**Branching Action**
	3a	If the user puts in an invalid username or password, they will be presented with an error. (I recommend that all text fields keep data stored to prevent user from having to insert them again)
Open Issues	Storing username and password information in a database or text files.	

Number	6	
Name	Account Protection	
Summary	Running the security questions to check and protect customer information.	
Priority	2	
Preconditions	Question must be close and easy for user to input the answer.	
Postconditions	The answer must match to database to verify the user's account.	
Primary Actor	account holder	
Secondary Actors	The information is saved in database.	
Trigger	pop a new site to ask user security question.	
Main Scenario	**Step**	**Action**
	1	a new page will show up with multiple security questions.
	2	Users pick and enter the question
	3	Users click to verify and access their account
Extensions	**Step**	**Branching Action**
	1a	If there are 3 wrong answers are entered. The account will be temporarily blocked.
Open Issues	There will be symbol on special letter from the input's user	

Number	7	
Name	Profile Picture	
Summary	User who wants to post their picture to be used as profile picture.	
Priority	1	
Preconditions	User name must be highlighted or clickable to be able to edit	
Postconditions	It is easy to browse and post user's picture	
Primary Actor	account holder	
Secondary Actors	It will be stored in the database.	
Trigger	Click on the user name	
Main Scenario	**Step**	**Action**
	1	Click on user name to pop a medium window
	2	Browse your picture and click Ok
	3	Back to the main page with your picture posted.
Extensions	**Step**	**Branching Action**
	1a	The picture maybe over sized of the designed window.
Open Issues	There are so many types of picture's file such as pn, jig	

Number	8

Name	Search function	
Summary	User can use this tool to search for airport	
Priority	4	
Preconditions	User enter a location name in the search field	
Postconditions	Displays results of all nearby airports	
Primary Actor	Any anonymous user	
Secondary Actors	Database server	
Trigger	User click on the search button	
Main Scenario	**Step**	**Action**
	1	User enter in a value in the text field
	2	User click on the search button
	3	Search result displayed
Extensions	**Step**	**Branching Action**
	2a	user click on search button without value in text field, no result displayed
Open Issues	User enter zip code of city to search instead of city names	

Number	9	
Name	Late Penalties	
Summary	Penalties given to users who fail to do task by assigned date.	
Priority	4	
Preconditions	User fails to acquire plane on designated date, or fails to check out in a timely manner.	
Postconditions	Penalty is given to user.	
Primary Actor	User checking in or out an airplane.	
Secondary Actors	Companies using online airplane service as a way of managing customers.	
Trigger	User showing up late or not at all, or failing to check out plane,	
Main Scenario	**Step**	**Action**
	1	User registers plane online.
	2	Shows up on assigned date
	3	User arrives to destination on time, but fails to check out plane. Penalty is given.
Extensions	**Step**	**Branching Action**
	2a	If user does not show up on assigned date, or not at all, a penalty is given.
Open Issues	Determining what sort of penalty is given for each misuse of company resources.	

Number	10

Name	Check In	
Summary	Allow users to check in Airplanes from different airport location	
Priority	5	
Preconditions	To check in, the user needs to have an airplane.	
Postconditions	User should be able to check in airplanes.	
Primary Actor	User checking in an airplane.	
Secondary Actors	Companies using online airplane service as a way of managing customers.	
Trigger	Check In Button	
Main Scenario	**Step**	**Action**
	1	User logs in
	2	User searches for the nearest airport and airplanes
	3	User check in the the airplane at any airport.
Extensions	**Step**	**Branching Action**
	2a	N/A
Open Issues	Misuse of planes or damage occurred to airplanes.	

Number	11
Name	Check Out

Summary	Allow users to check out Airplanes from different airport location	
Priority	5	
Preconditions	To check you, the airplanes must be available at the airport.	
Postconditions	User should be able to check out airplanes.	
Primary Actor	User checking out an airplane.	
Secondary Actors	Companies using online airplane service as a way of managing customers.	
Trigger	Check In/Check Out Button	
Main Scenario	**Step**	**Action**
	1	User login in
	2	User searches for the nearest airport and airplanes
	3	User checks out an airplane.
Extensions	**Step**	**Branching Action**
	2a	If no airplanes are available then put the user on hold.
Open Issues	N/A	

Number	12
Name	User Profile Page
Summary	Actions users can take when they reach their profile page.
Priority	2

Preconditions	User queries for account information	
Postconditions	Data is received and shown	
Primary Actor	User making change.	
Secondary Actors	Server updating change.	
Trigger	User simply logging in, or making a query for a specific piece of data.	
Main Scenario	**Step**	**Action**
	1	User queries account information.
Extensions	**Step**	**Branching Action**
	1a	User is given account settings on request. (IE automatic email updates, PM information, etc)
	1b	User is shown all current and past plane transactions.
Open Issues		

Number	13
Name	Administrative User
Summary	Can access the administration page. Can add planes/airports if necessary.
Priority	4
Preconditions	N/A

Postconditions	Has access to the administration page	
Primary Actor	Administrator	
Secondary Actors	N/A	
Trigger	Administrator logs in	
Main Scenario	**Step**	**Action**
	1	Administrator logs in
	2	Has access to administration page
Extensions	**Step**	**Branching Action**
	1a	N/A
Open Issues	If the administrator is flag as a user and can't access the admin page	

Number	14
Name	Administrative Page
Summary	Displays all users who exist in the database. Shows which users have checked out a plane. Shows which users are in a waiting list. Planes/airports can be added.
Priority	4
Preconditions	Administrator requests page access

Postconditions	Administrator has access to the page	
Primary Actor	Administrator	
Secondary Actors	Planes for Hire database	
Trigger	Administrator logs in	
Main Scenario	**Step**	**Action**
	1	Administrator logs in
	2	Administrator accesses page
	3	Page is displayed
Extensions	**Step**	**Branching Action**
	3a	Administrator adds plane/airports to the page
Open Issues	Normal users must be flagged so they won't have access to the admin page.	

Number	15
Name	Waiting List
Summary	Put user on waiting list if user checks out and a requested plane is not available
Priority	4
Preconditions	User checks out and a plane is not available
Postconditions	Put user on the next available slot on the waiting list

Primary Actor	User checks out a plane	
Secondary Actors	Application database	
Trigger	User decides to check out by clicking the checkout button	
Main Scenario	**Step**	**Action**
	1	User click checkout button
	2	Application checks planes database
	3	Application checks waiting list database
	4	Application tells user their position in line
	5	Application add user to waiting list
Extensions	**Step**	**Branching Action**
	4a	user cancel from added to waiting list
Open Issues	Allow user ability to be drop from waiting list	

Number	16
Name	User Registration
Summary	Allow user to register an account with the application
Priority	5
Preconditions	User clicks on the register link
Postconditions	User successfully creates an account
Primary Actor	The user

Secondary Actors	Application database	
Trigger	User decides to click on the register link	
Main Scenario	**Step**	**Action**
	1	User click on the register link
	2	Application loads registration page
	3	User enters their information
	4	Application adds user to database
Extensions	**Step**	**Branching Action**
	4a	User name already exists in database
Open Issues	Allow user to close account	

3. Use Case Tests

Use case testing is a vital part of product validation and verification. The final product should both work how originally intended and be bug free. These tests outline how to test to the requirements during both system and release testing.

3.1 Use Case 1 Test- Google Maps

A top view of locations of airports near the user. It allows the user to see the time and distance to their destination. See Testing Report for further details and results.

3.2 Use Case 2 Test- Clickable Pins

Drop down pins for user selected source and destination. See Testing Report for further details and results.

3.3 Use Case 3 Test- Airports

Making 30 planes using an object class to simulate rentable planes. See Testing Report for further details and results.

3.4 Use Case 4 Test- Airplanes

Making 10 airports that will simulate real locations where the planes can land. See Testing Report for further details and results.

3.5 Use Case 5 Test- User Login

Having an easy to access login system incorporating a username and password. See Testing Report for further details and results.

3.6 Use Case 6 Test- Account protection

Running the security questions to check and protect customer information. See Testing Report for further details and results.

3.7 Use Case 7 Test- Avatar

User who wants to post their picture to be used as profile picture. See Testing Report for further details and results.

3.8 Use Case 8 Test- Search function

User can use this tool to search for airport. See Testing Report for further details and results.

3.9 Use Case 9 Test- Late penalties

Penalties given to users who fail to do task by assigned date. See Testing Report for further details and results.

3.10 Use Case 10 Test- Check in

Allow users to check in Airplanes from different airport location. See Testing Report for further details and results.

3.11 Use Case 11 Test- Check out

Allow users to check out Airplanes from different airport location. See Testing Report for further details and results.

3.12 Use Case 12 Test- User profile

Actions users can take when they reach their profile page. See Testing Report for further details and results.

3.13 Use Case 13 Test- Administrator user

Can access the administration page. Can add planes/airports if necessary. See Testing Report for further details and results.

3.14 Use Case 14 Test- Administrator page

Displays all users who exist in the database. Shows which users have checked out a plane. Shows which users are in a waiting list. Planes/airports can be added. See Testing Report for further details and results.

3.15 Use Case 15 Test- Waiting list

Put user on waiting list if user checks out and a requested plane is not available . See Testing Report for further details and results.

3.16 Use Case 16 Test- User registration

Allow user to register an account with the application. See Testing Report for further details and results.

4. Non-Functional Requirements

Some things are a necessity when creating a web application. Below outlines the criteria used to judge the system as a whole. For each item, a goals section is added to verify each one of the non-functional requirement.

#	Item	Priority (lowest-1) (highest-5)	Goals
1	Server-side code written in php.	5	Protecting and interacting with server-side data while adding interactivity to web pages will be possible.
2	Server is safe and secure from attacks	2	Only those who have synced up with the database can access important information
3	Homepage is well formatted and aesthetically pleasing.	4	User should not daunted by crazy formatting.
4	Website is easy to navigate	2	User should be able to navigate the webpage within 5 minutes.
5	Code is well documented	2	Programmers will not confuse themselves with incomprehensible spaghetti code.
6	Server is an Apache server	5	Server uses a platform understood by many.
7	Server communicates with MySql database to store user information.	3	Have easy access to data stored on server with technology understood by many.
8	Server quickly responds to queries	2	Users should not get have to wait while their page loads.
9	Server code is portable	2	make it easier to implement in any operating systems.
10	Server is scalable.	3	Programmers should make sure that the website should never crash when the traffic increase dramatically
11	Use four spaces for indentation	2	Programmers are able to read the

			code more cleanly

5. User Interface

See “User Interface Design Document for *Planes for Hire*.”

6. Deliverables

Deliverables include:

- Systems Requirement Specification
- System Design Document
- User Interface Design Document
- Copies of all weekly Status Reports

A CD (or electronic copy in a ZIP file) containing the following:

- Systems Requirement Specification
- System Design Document
- User Interface Design Document
- User Manual
- Administrator Manual
- All source code
- The executable program
- Any other software required for installation and execution of the delivered program.

7. Open Issues

Issues that have been raised and do not yet have a conclusion. These issues will be addressed later in the development process. Please refer to the table below.

Issues	**Scheduled for**
Database Protection	Spiral 3
Account Protection	Spiral 3
Waiting List implementation	Spiral 3

Bootstrap and CSS	Spiral 3
Connecting Twitter API	Spiral 3

8. Appendix A – Agreement Between Customer and Contractor

The customer agrees to a Planes For Hire web application with searching, google maps, and user accounts with security encryption capabilities. Use cases are included in the functional requirements section above of the behavior between the system and user. Additional features will be provided in further development spirals.

When and if future changes to this document occur a drafted new document will be created. Both a hard and electronic copy of both versions will be presented to the client for review. Upon approval, the draft will be finalized and signed off by both parties.

Client

Name ____
Date ____
Sign ____

Team

Name ____
Date ____
Sign ____

Name ____
Date ____
Sign ____

Name ____
Date ____
Sign ____

Name ____
Date ____
Sign ____

Name ____
Date ____
Sign ____

9. Appendix B – Team Review Sign-off

This document has been collaboratively written by all members the team. Additionally, all team members have reviewed this document and agree on both the content and the format. Any disagreements or concerns are addressed in team comments below.

Team

Name ____
Date ____
Sign ____
Comments ____
____
____

Name ____
Date ____
Sign ____
Comments ____
____
____

Name ____
Date ____
Sign ____
Comments ____
____
____

Name ____
Date ____
Sign ____
Comments ____
____
____

Name ____
Date ____
Sign ____
Comments ____
____
____

10. Appendix C – Document Contributions

Sundar Sekar took the lead on the writing of this document with creating the document on google drive and sharing with the team members. He began the writing of the use cases and other functional requirements,introduction, appendices A and C and created table of contents with hyperlinks. He played a major part in assembling and reviewing the document. Robert Melgar contributed by writing use cases, appendices B, adding to non-functional requirements, document formatting as well as creating the UML. Tam Tran contributed by creating product scope, diagrams, introduction and use cases. William Andrew Cahill contributed by creating open issues, use cases, and deliverables. Du Nguyen contributed with uses cases.

Sundar, Andrew, and Roberto updated the document for Spiral 2.