Software Requirements Specification

Find My Bathroom

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1. PREFACE

The expected readership of this document are the officials from the City of San Jose who will approve this project. This is the first version of the document, so there are no changes.

2. INTRODUCTION

This section will describe the need for the system. It will briefly describe the system's functions and explain how it will work with other systems. It will also describe how the system fits into the overall business or strategic objectives of the organization commissioning the software.

2.1. Need for system

Many new SJSU students and people that are unfamiliar with downtown San Jose have trouble finding nearby, clean accessible bathrooms. The "Bathroom Indicator" app is a web-based application which helps people to find the closest bathrooms based on the user's current position and the user's preference on cleanliness.

2.2. System's functions

The system will display a map GUI of the user's current location, and the location of nearby bathrooms. Details and reviews of each bathroom can be viewed if the user selects the bathroom. The system will also allow the user to write reviews for selected bathrooms, and add new bathrooms to the map GUI.

All system information is maintained in a database, which is located on a web-server. The system will work with the GPS software that is installed inside the user's client. The GPS software will allow users to navigate to desired bathrooms and view nearby bathrooms based on their current location.

2.3. Overall Business and Objectives

The City of San Jose is trying to improve its business through popularity and tourism, especially in downtown. To increase popularity and tourism, the City of San Jose has focused their strategic objectives on public safety, cleanliness, and hospitality. This application will allow people to efficiently access clean bathrooms in San Jose. This can decrease public urination, which will increase public safety and cleanliness. Easy access to bathrooms will also increase the city's hospitality. As a result, an improved San Jose community will emerge, and the city will attract more tourists and college students.

3. GLOSSARY

This section will define the technical terms used in the document.

Term	Definition
GPS	GPS (Global Positioning System) is a global navigation satellite system that provides geolocation and time information
GUI	GUI (graphical user interface) is a type of user interface that allows users to interact with software through graphical icons and visual indicators
Web Application	A Program that is stored on a remote server and delivered over the Internet through a browser interface.
Client	A piece of computer hardware or software that accesses a service through a server
User	One that interacts with the application
API	API (application programming interface) is a set of definitions, routines, and protocol for building software applications
SJSU	San Jose State University
unisex	Designed to be suitable for both sexes
UI	UI (user interface) is the means by which the user and a computer system interact, in particular the use of input devices and software.

4. USER REQUIREMENT DEFINITION

This section will describe the services provided/product functions for the user. The nonfunctional system requirements will also be described in this section. This description will include natural language, diagrams, or other notations. Product and process standards will also be specified.

4.1. Services provided/product functions

With this web application, users will be able to search for bathrooms. Bathrooms based off of the user's preference of search criteria and location will appear. Several search criteria options consist of bathroom gender-type, bathroom rating, and radius.

The search results will be shown in a list view and a map view simultaneously. The list view will contain a list element for each bathroom that fits the search criteria and location of the user. In addition, the list view will also show the rating and details/reviews of the bathroom. The map view of the search results will show each bathroom location as a pin. The map view will also show the user's location and navigate the user to any bathroom that the user selects. The user can select bathrooms on the map view or the list view.

4.2. Nonfunctional system requirements

The system must require a GPS navigation system on the user's client in order to obtain the user's current location and navigate the user to selected bathrooms. The system's GUI will use Google Maps API.

The system will also require internet connection to run because the application will be sending/receiving data to/from the database over the internet. The database will be hosted on a server, so the application will need to use the internet to manipulate data with the database.

4.3. User stories/scenarios

4.3.1. User Story

1. At the beginning of the application, the system will display its main menu. The main menu will show a list of all bathrooms in a 5 mile radius of the user's current location. The list will display the name, location, rating, and small details/reviews of the bathroom. In addition, the main menu will display those same bathrooms on a map GUI as pins.

2. The user will be able to choose/enter certain criterias such as rating, radius, and bathroom gender type to filter through bathrooms. Users will choose rating with numbers one to five. Users will also enter a radius to specify the distance that the system will search bathrooms for from the user's current location. Bathroom gender type will allow

the user to choose between unisex bathrooms, mens bathroom, womens bathroom, or all bathrooms. Based off of the user's criteria, the list and map GUI display of bathrooms will change.

3. The user will be able to choose bathrooms from the map GUI by selecting the pins. Alternatively, the user can also select bathrooms from the list. After the user selects a bathroom, the system will load a bathroom menu with a series of choices. The user can choose to navigate to the bathroom, rate the bathroom, read reviews/details of the bathroom, or return to the main menu.

4. The user chooses to navigate to the bathroom and the system will run a navigation GUI, which guides the user with directions to the bathroom. After the user arrives to the bathroom, the system will exit the navigation GUI and reload the bathroom menu.

5. The user chooses to rate the bathroom and the system will open a star-rating UI. The user will be able to rate bathrooms 1 star, 2 stars, 3 stars, 4 stars, or 5 stars. 5 stars will be the highest rating and 1 star will be the lowest rating. After the user rates the bathroom, the system will exit the star-rating UI and reload the bathroom menu.

6. The user chooses to read reviews/details of the bathroom and the system will open a bathroom-rating UI. The bathroom-rating UI will list all reviews of the bathroom that were posted by other users. It will also list details of the bathroom, such as its name, rating, location, cleanliness, and distance (miles) from the user's current location. In addition user can have the option to write a review as well.

7. The user chooses to return to the main menu.

4.3.2. Scenarios

1. Sheila and Tom were roaming the streets of San Jose absorbing the culture. They visited a lot of boba places around town like the locals do. After drinking their boba, they were walking around town when Sheila needed to use the restroom. So she opened our web app on her cellular device. She was able to then find the closest bathroom to her.

2. Joey was leaving a football game at the CEFCU Stadium in San Jose. He needed to use the bathroom but there were too many people and too few restrooms. He pulls up our web app on his phone and finds a bathroom 2 blocks away where he is able to use peacefully.

3. Chandler is a shy student at SJSU. He is nervous to use the bathroom when other people are there. When he is studying on campus and realizes he has to pee, he goes to our website and finds a bathroom where the reviews say it's quiet. He then goes there and uses the bathroom by himself.

4. Ross and Rachel are on a break. Rachel hates dirty bathrooms. The sight of it makes her wanna throw up. When she shares this with Ross, he lets her know of our web app which will allow her to find clean bathrooms around campus. She follows his suggestion and finds a clean bathroom that she finds pleasant to use.

5. Phoebe finds herself in San Jose after a night out with her friends. A lot of restaurants are closed and she is struggling to find somewhere to relieve herself. She remembers that there is a web app which can tell her where to find bathrooms. She pulls up the app on her smartphone and finds the bathrooms around her that are open.

5. SYSTEM ARCHITECTURE
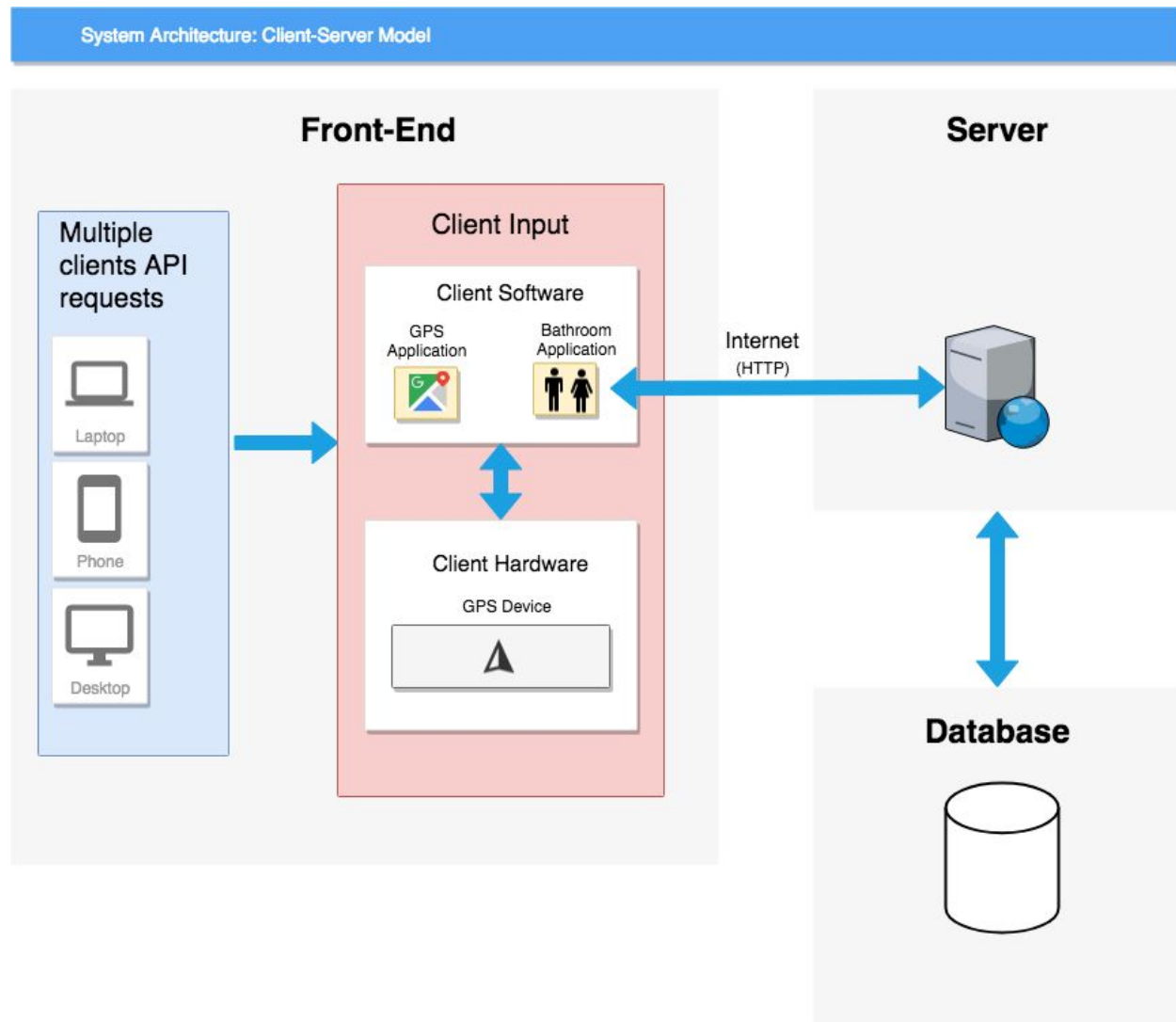
6. REQUIREMENT SPECIFICATIONS

The system's functional, non-functional, and UI requirements will be explained in more detail. It will give detailed descriptions of the system and its features.

6.1. Functional Requirements

Statements of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situations.

6.1.1. Functional requirement 1.1

Access web application
Description: A user shall be able to access the web application through any computer device, including mobile devices through the internet with HTTP.

6.1.2. Functional Requirement 1.2

Access user location
Description: The system shall ask the user for permission to their location data, and update their current location on the GPS. The user must give permission in order to navigate to bathrooms later.

6.1.3. Functional Requirement 1.3

Map/List GUI
Description: After user has allowed their location data, the system will generate a list, showing all the bathrooms within a 5 mile radius of the current user location. The system shall also generate a map, showing all the bathrooms, as a pin, within a 5 mile radius of the current user location. The user shall be able to filter through bathrooms with criterias based off of gender-type, rating, and radius. In addition, the user shall be able add a new bathroom to the system.

6.1.4. Functional Requirement 1.4

Add bathroom from Functional Requirement 1.3
Description: The user shall be able to input a bathroom name, location, photo, rating, and gender-type. In order to successfully add a bathroom, the bathroom name, location, and gender-type must be inputted.

6.1.5. Functional Requirement 1.5

Choose bathroom from Functional Requirement 1.3

Description: The user can select a pin on the map or the user can select a bathroom from the list. When they select the desired bathroom, the system shall display a new bathroom UI that shows the bathroom name, rating, location, and reviews/details. The user will then be able to choose to navigate to the bathroom, to rate the bathroom, or to go back to the Map/List GUI.

6.1.6. Functional Requirement 1.6

Choose navigate from Function Requirement 1.5
Description: When the user chooses to navigate to the bathroom, a new tab will pop up with google maps directing the user to the location of the bathroom. When they have arrived at their destination, the user can go back to the bathroom UI from Functional Requirement 1.5.

6.1.7. Functional Requirement 1.7

Choose rate from Function Requirement 1.5
Description: Once the user arrives to the bathroom UI, they can choose to rate and leave a review/details for the bathroom.

6.1.8. Functional Requirement 1.8

Choose gender-type criteria from Function Requirement 1.3
Description: The user will be able to choose 3 options for for the bathroom gender-type. The user can choose unisex bathrooms, gender-specific, or all. Based on the user's choice, the Map/List GUI will list bathrooms that fit the criteria.

6.1.9. Functional Requirement 1.9

Choose rating criteria from Function Requirement 1.3
Description: The user will be able to choose the rating of bathrooms from one to five. One will be the lowest rating of the bathroom and five will be the highest. Based on the user's choice, the Map/List GUI will list bathrooms that fit the criteria.

6.1.10. Functional Requirement 1.10

Choose radius criteria from Function Requirement 1.3
Description:The user will be able to choose a certain range to locate the bathroom for their current location. Based on the user's choice, the Map/List GUI will list bathrooms that fit the criteria.

6.1.11. Functional Requirement 1.11

Server accepting new bathroom data
When a new bathroom is added, the server should take the request and send it to the database. The server should keep the website updated with the data.

6.1.12. Functional Requirement 1.12

Server accepting modifications
When a new rating or review is added to a bathroom, the server should allow the modification and update the database with the new rating/review.

6.1.13. Functional Requirement 1.13

Server retrieving data
When a request is made for data, the server should be able to fulfill it.

6.2. Non-Functional Requirements

Defines the system properties and constraints such as reliability, response time and storage requirements.

6.3. Application Accessibility

6.3.1. Non-Functional Requirement 1.1

Front End and Back End
Description: The product has a front end, which is the map GUI that will project the user's current location and the location of the bathrooms. The back end of the product includes a MySQL database that consists of bathroom data such as its rating, reviews, and location.

6.3.2. Non-Functional Requirement 1.2

Accessibility
Description: The web application is free to use for any user around the globe. User will only need access to Internet.

6.3.3. Non-Functional Requirement 1.3

Allow user location
Description: The system will prompt the user to allow their location so that they system can show nearby bathrooms around them. A pin will be shown on the map to represent the user's current location.

6.3.4. Non-Functional Requirement 1.4

Internet Connectivity
Description: The user must have access to the internet in order for them to use the web application. The system will constantly be working hand in hand with the database to update

data, such as the bathrooms available. When the user is not connected to the internet, their web browser will alert them of the issue so they will know where the problem is coming from.

6.3.5. Non-Functional Requirement 1.5

Denied Internet Access
Description: If the user's device cannot connect to the internet and they attempt to open our web application, our application will project a screen that states "No Internet. Please connect to device to internet"
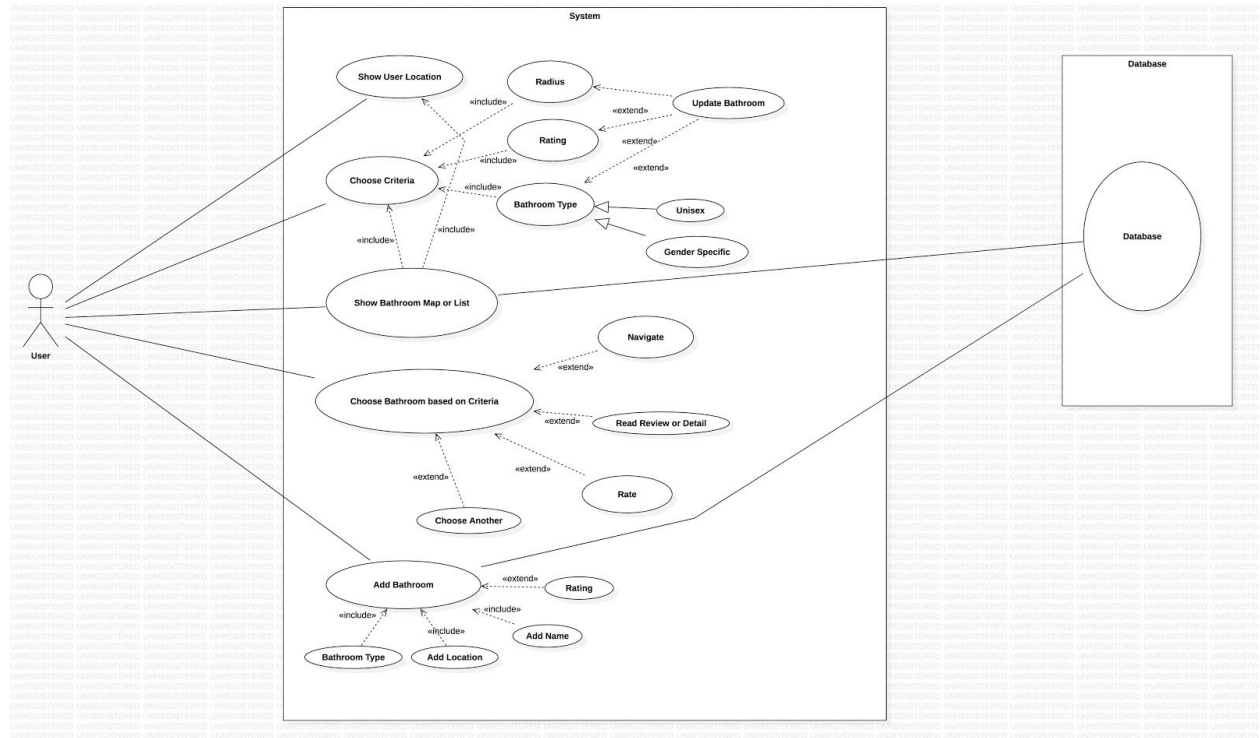
6.4. User-Interface Requirements

The user-interface requirements are specified in this video below:
https://goo.gl/ahRcFo

7. SYSTEM MODELS

7.1. Use Case Diagram

7.1.1. Use Case: Show User Location

Actors: Customer i.e person
Description: The user opens up the web application, the application will show a map.
Response: When the map is projected, the system will respond by showing the users current location on the map. The user's current location will be pinned on the GUI Map.

7.1.2. Use Case: Choose Criteria

Actors: Customer i.e person
Description: The user can select the type of bathroom they want to go to by picking a certain radius, rating, and bathroom type. Within the bathroom type, the user can decide if they want a unisex or a gender specific bathroom.
Response: As the user picks a radius, rating, or the bathroom type, the GUI Map will be updated to the user specification.

7.1.3. Use Case: Show Bathroom Map or List

Actors: Customer i.e person

Description: The map in the web application will show all the bathrooms located via a pin. Also the bathrooms will be shown in a list on the right side of the web application screen.
Response: The system will project the bathrooms using the user location around them. The bathrooms will also be listed on the side of the screen so that user can select a specific bathroom and look at its details.

7.1.4. Use Case: Show Bathroom Based on Criteria

Actors: Customer i.e person
Description: The user can pick a bathroom from the updated map from use case 7.1.2, and decide to navigate to that bathroom, leave a review about that bathroom, or rate the bathroom
Response: If the user decides to navigate to the bathroom, then the system will direct the user to the bathroom. Also if the user leaves a review then the system will update the review about that bathroom, and if the user leaves a rating then the system will update the rating of that bathroom and save it.

7.1.5. Use Case: Add Bathroom

Actors: Customer i.e person
Description: The user can add a bathroom on the Map if that certain bathroom they are at is not located on the map.
Response: The system will add the new bathroom to the database and project in show bathroom map or list (use case 7.1.3).