Skadoosh Design

Skadoosh, allowing everyone to find cleaner bathrooms and notifying owners of dirty ones.

TEAM YELLOW

CS 410

OLD DOMINION UNIVERSITY

April 24, 2019

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Our Team

Brandon Feldhaus
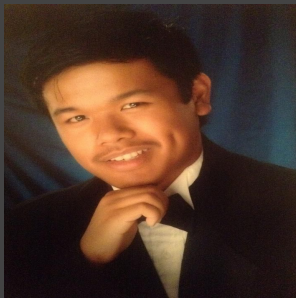Project Coordinator

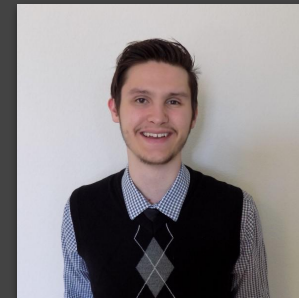Kevin O'Brien
Systems Engineer

Bryan Perez
React UI Mobile
Developer

John Edgar Monroe
Quiambao
DB Engineer

James Zeigler
Web Developer

Daniel Zrust
React Mobile Developer

Problem

► Real-time feedback about cleanliness and amenities of restrooms available for public use is difficult to find and the ability for facility owners to use this feedback does not exist.

Ewwww (500,000 bacteria!)

► 63% of Americans had unpleasant experience with public restrooms [1]

► Close to 75% of people surveyed said an unclean restroom suggest poor management [1]

► 60% of people delay defecation in public restroom [3]

[1] PR-Newswirem

[2] Enviro-Master

[3] Theconversation

Top Complaints

Survey by The Bradley Corporation [1]

[1] PR-Newswirem

Top Restroom Complaints Among Men and Women 18-65

| | Smell | Toilet Functionality | Appearance |
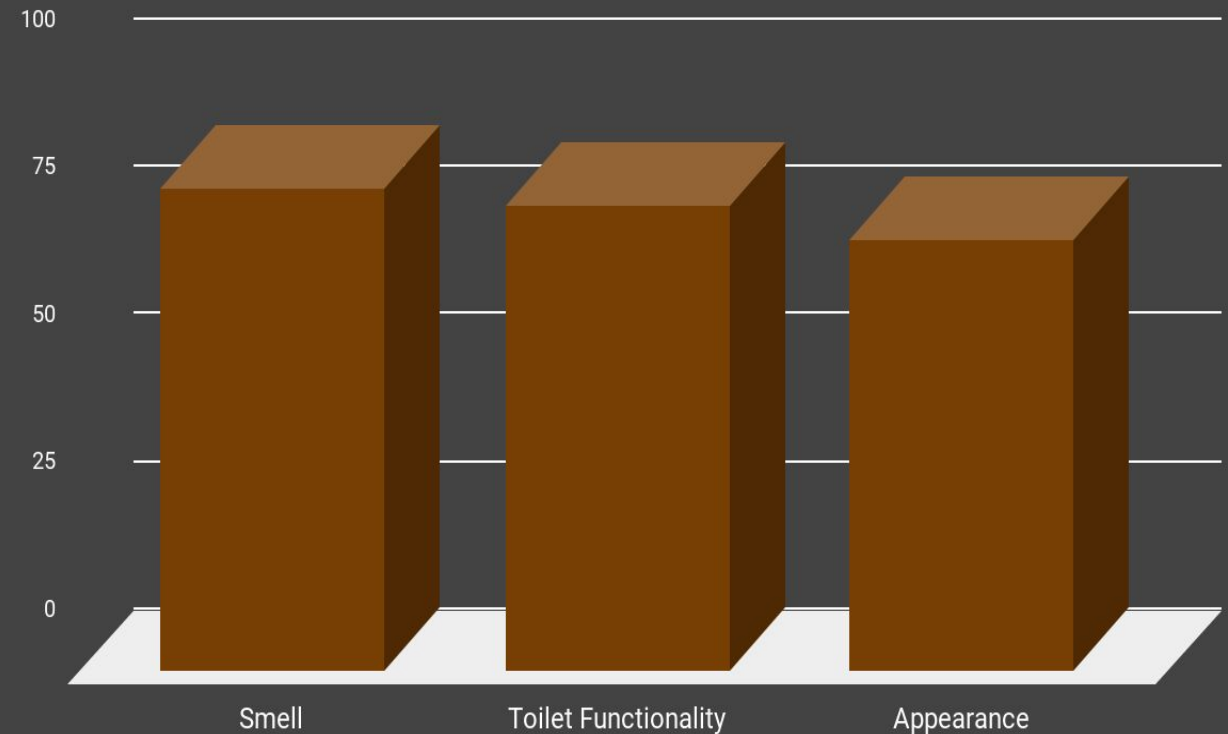
Coming back?

► Among the survey, the following locations were asked about

Survey by the Clintas Corporation

Clintas Corporation

Establishments

Return
Avoid

100%

75%

50%

25%

0%

Hotels   Retail Stores   Gas Stations   Supermarkets

CS 410 | Team Yello | Feasibility
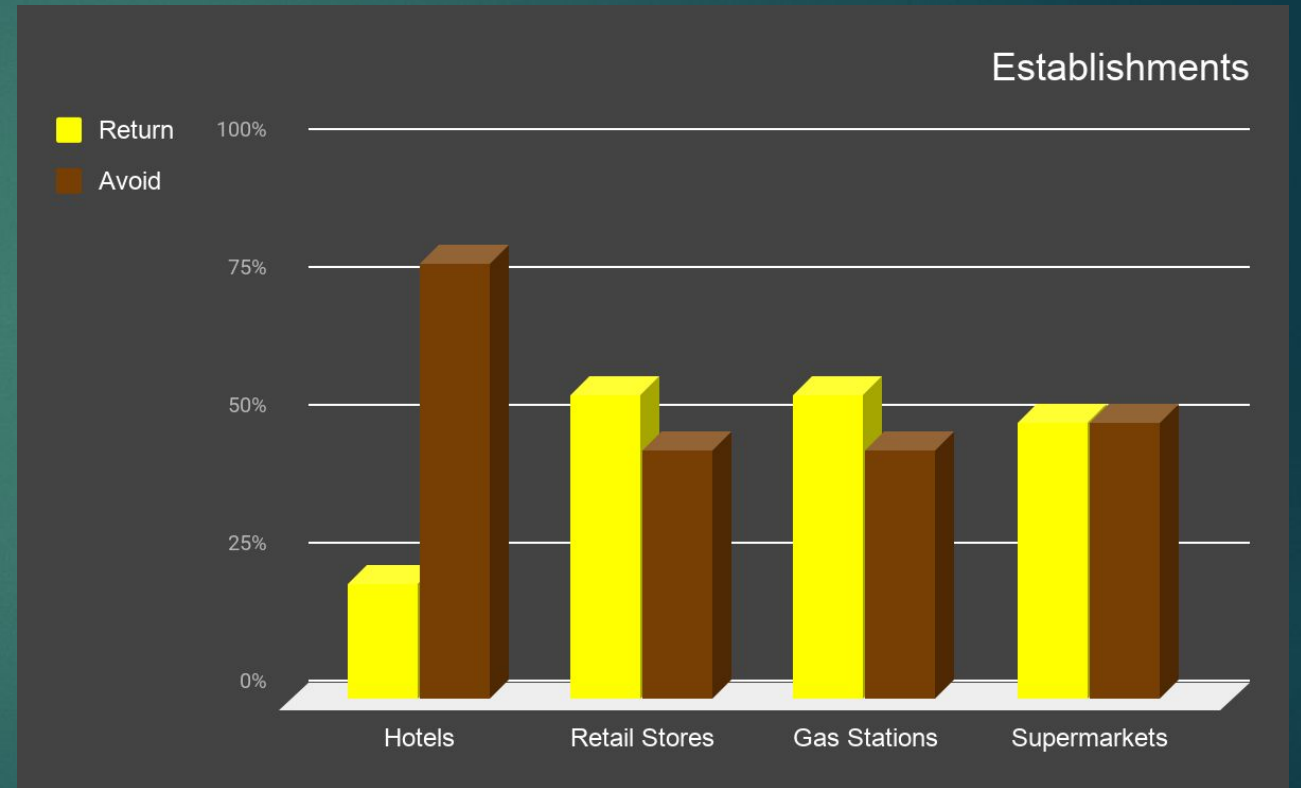
Bathroom Cleanliness Affects Businesses

► The survey also showed, 79% of customers would not return a restaurant with dirty restrooms

Survey by the Clintas Corporation

Clintas Corporation

Dirty restrooms can cause lost of business

- Not Coming Back
- Coming Back

21.0%

79.0%
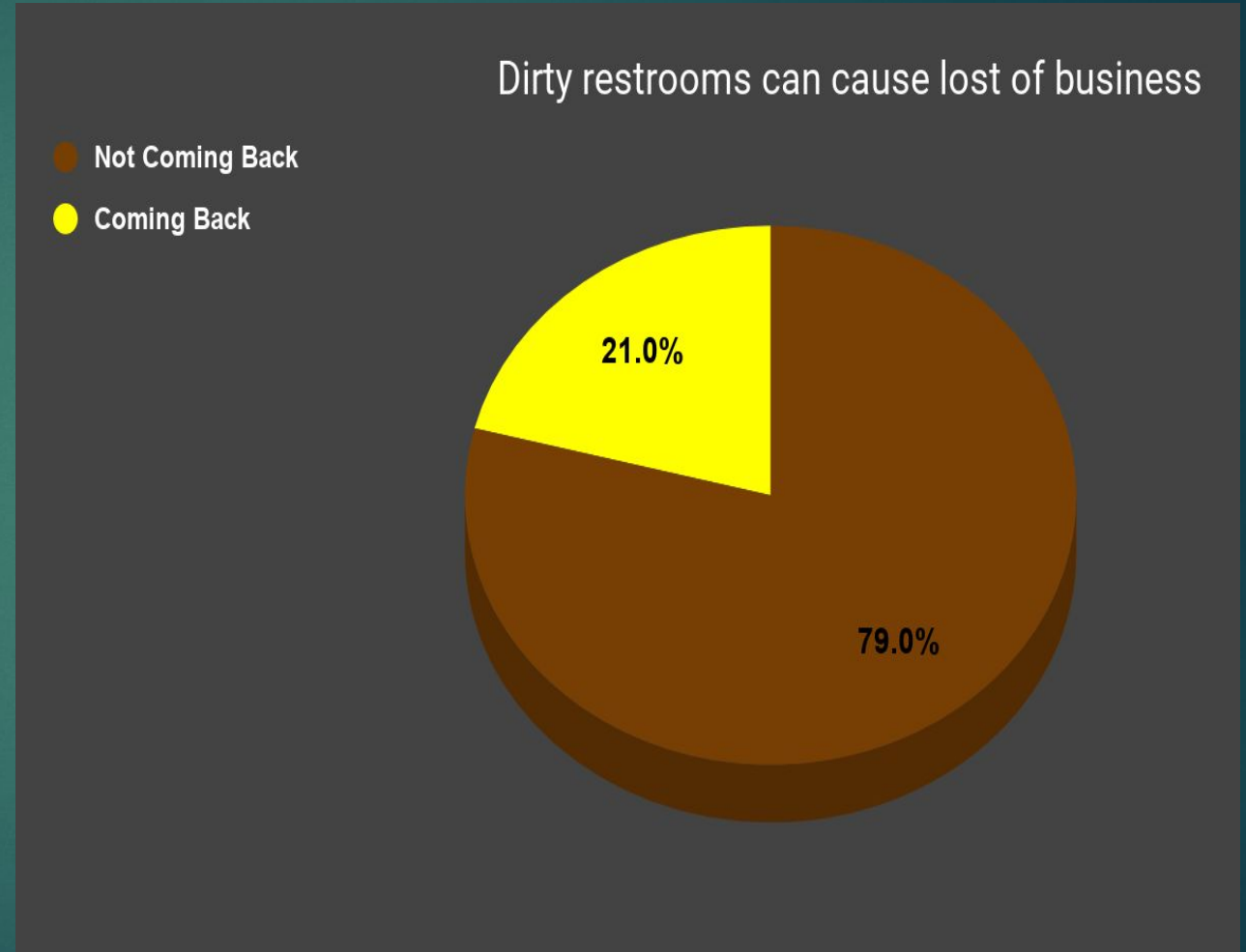
Problem Characteristics

▶ No real-time feedback analysis for owners and people concerning restroom cleanliness

▶ Lack of amenities such as:

   ▶ No soap

   ▶ Hand Dryers not working

   ▶ No hand towels

▶ Quality of amenities

▶ Gender neutral restrooms are uncommon

▶ Owners lack of cleaning

Ideal World

You need to use the restroom.

→

You locate the nearest facility.

→

You use the facility.

→

Finished. Nothing to report.

You need to use the restroom.

Finished. Issues Reported?

Report issue. There may or may not be any follow-up or feedback about the report.

You need to locate who and how to report issues. There may not be anyone locally

Need to set your needs

The location of the facility can be influenced by your needs.

- No changing station
- No Soap
- No Paper Towels
- Not Gender-Neutral
- The stall doors are broken
- NO TP!
- The door lock is broken
- No Lights
- Area is not safe
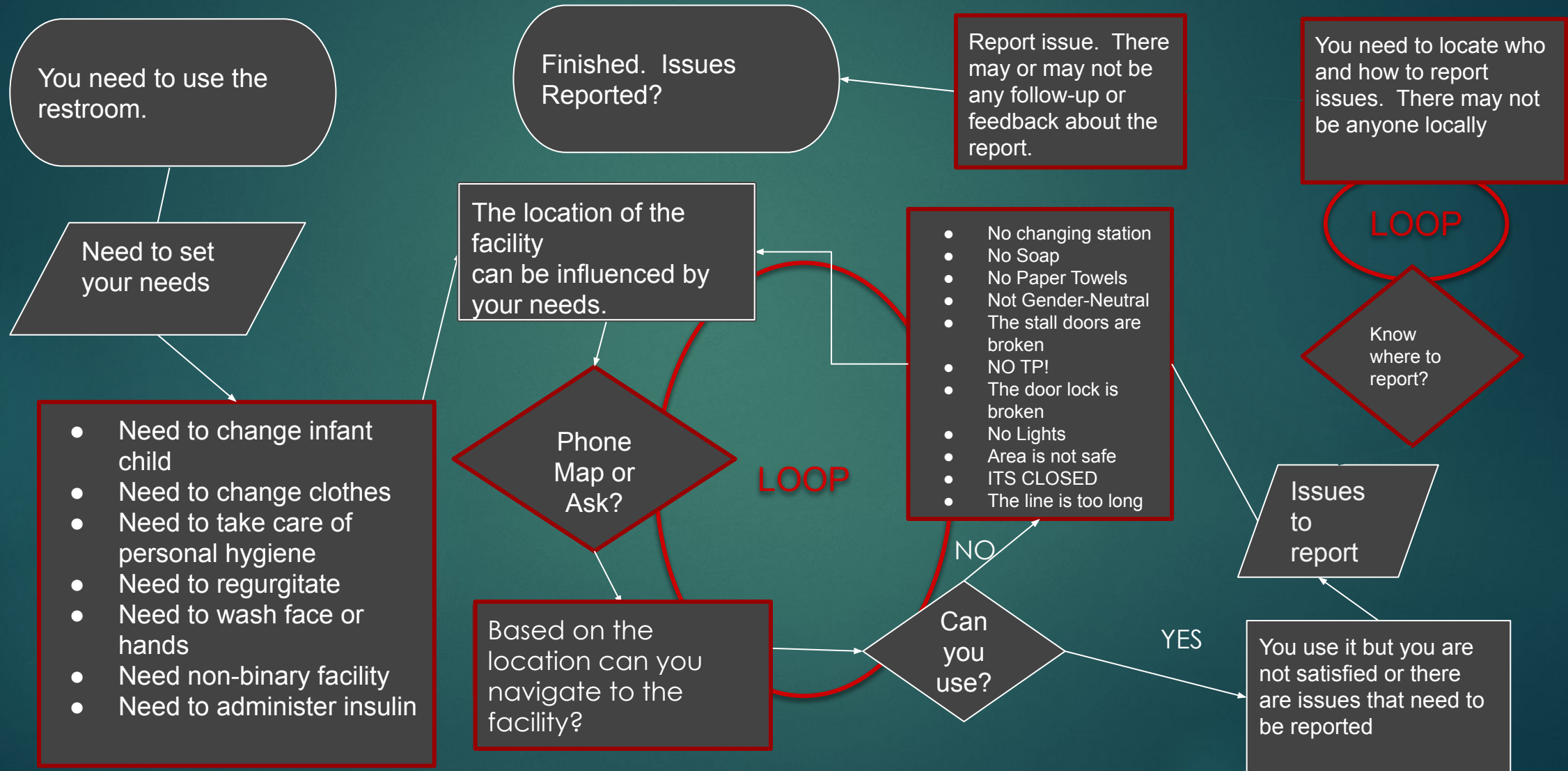- ITS CLOSED
- The line is too long

LOOP

- Need to change infant child
- Need to change clothes
- Need to take care of personal hygiene
- Need to regurgitate
- Need to wash face or hands
- Need non-binary facility
- Need to administer insulin

Phone Map or Ask?

LOOP

Know where to report?

NO

Issues to report

Based on the location can you navigate to the facility?

Can you use?

YES

You use it but you are not satisfied or there are issues that need to be reported

What about the owner?

Owner has metrics on the number of customers that visit for non-restroom reasons.

Owner imposes a cleaning schedule. Posts the schedule somewhere on-site.

Employee may discover an issue during scheduled cleaning.

Customer may report an issue to an on site employee.

It may never be known when the issue occurred, and how many customers may have been affected by the issue.

Customer may leave location without using facility and without reporting any issues.

There is a disconnect here

Cleaning or repair must be scheduled, potentially causing more down-time.

Facility is repaired, but this may not be an improvement

This is not improvement or customer needs focused flow.

Facility is cleaned. But this may not be the reason people may have left.

Solution Statement

► Skadoosh will provide users with the ability to locate and contribute real-time feedback that will notify owners of their restroom conditions.
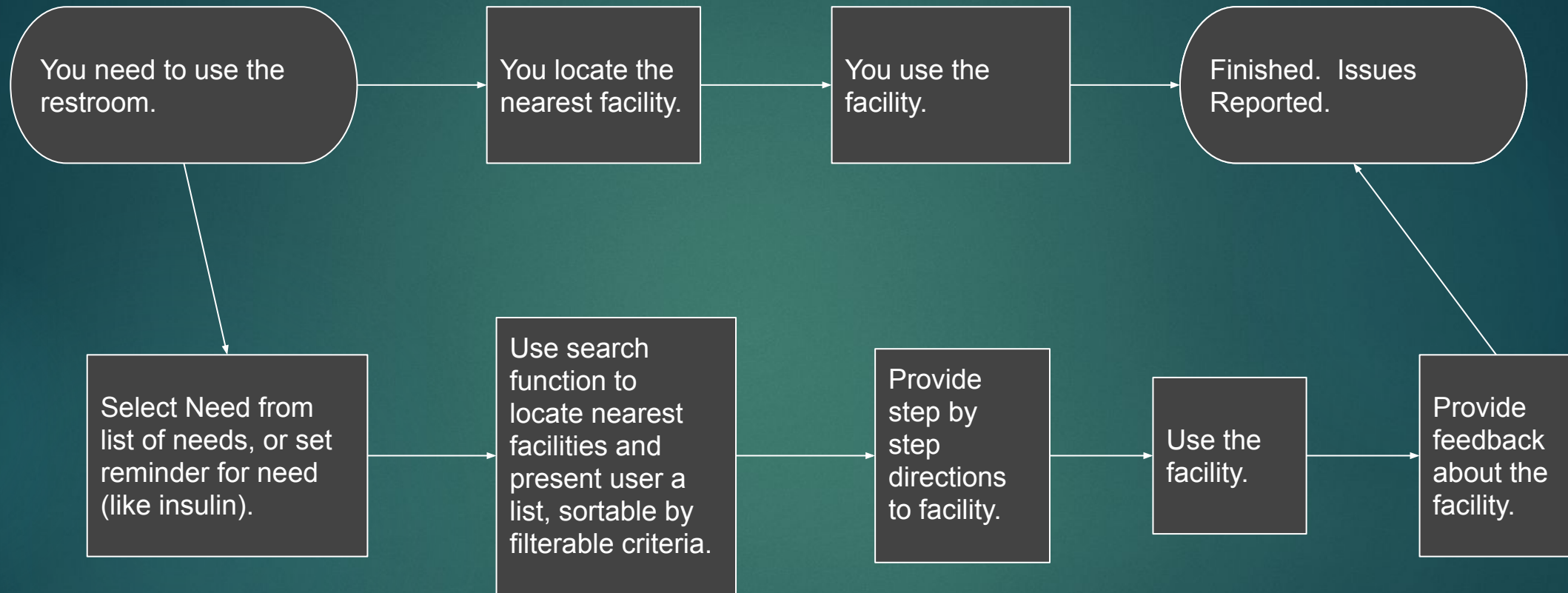
Solution Characteristics

- Feedback
  - Users can provide real-time feedback about facilities making complaints or suggestions
- User Profiles
  - Stores needs into a user profile shared with the application
  - Users can have multiple profiles
- Owner Profiles
  - Able to receive analytics and feedback about the facility
- Location Profiles
  - Locations have attributes that can be matched against user needs
  - Locations can be connected by special Owner Profiles
- GPS and facility matching
  - Locations can be located in maps and users can be guided to facilities
  - Users can create restroom location on their personal map and with verification from other users it can be added to the official map
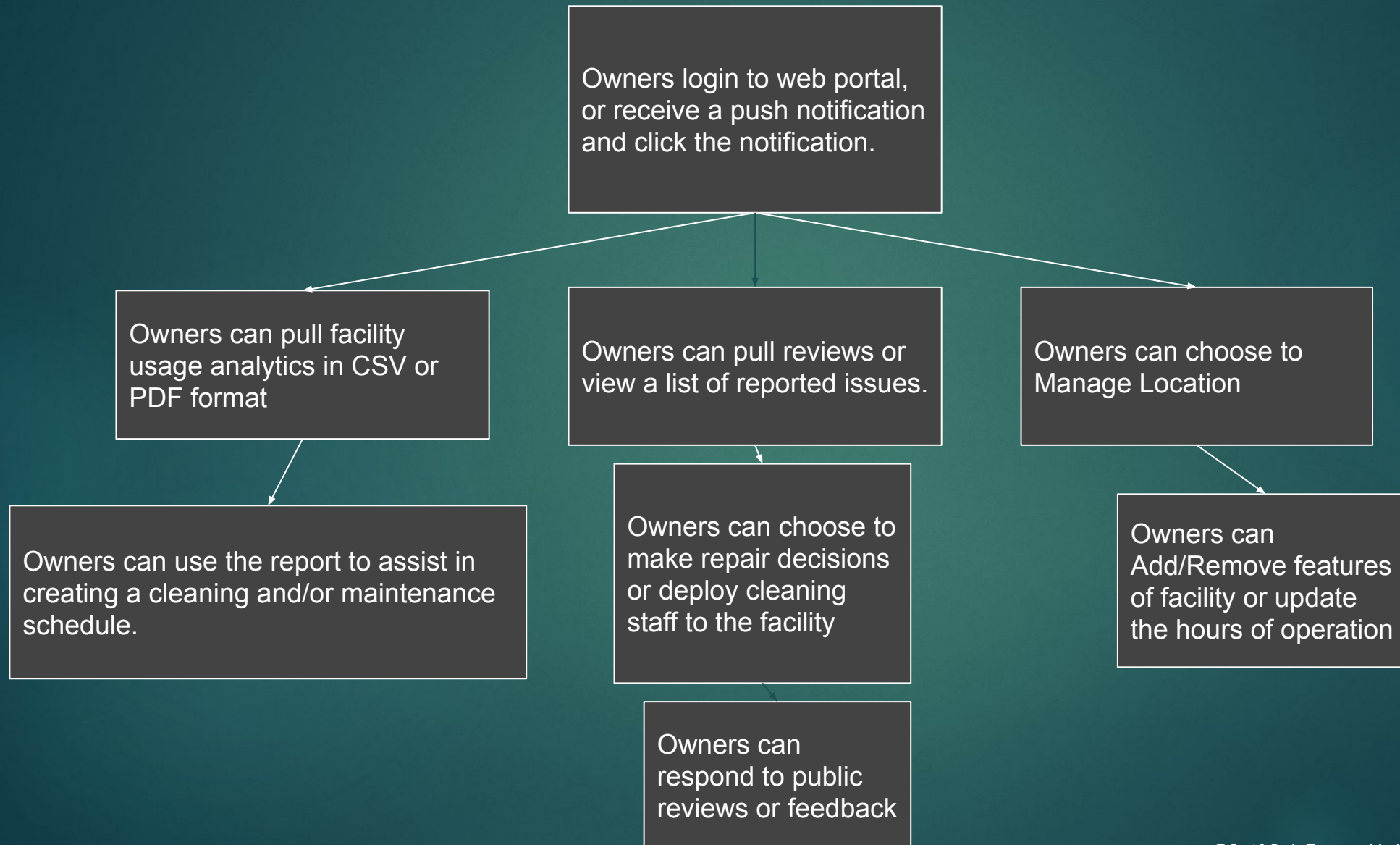
Can we improve the flow for users?

You need to use the restroom.

You locate the nearest facility.

You use the facility.

Finished. Issues Reported.

Select Need from list of needs, or set reminder for need (like insulin).

Use search function to locate nearest facilities and present user a list, sortable by filterable criteria.

Provide step by step directions to facility.

Use the facility.

Provide feedback about the facility.

Owners can have better flow too...

Owners login to web portal, or receive a push notification and click the notification.

Owners can pull facility usage analytics in CSV or PDF format

Owners can pull reviews or view a list of reported issues.

Owners can choose to Manage Location

Owners can use the report to assist in creating a cleaning and/or maintenance schedule.

Owners can choose to make repair decisions or deploy cleaning staff to the facility

Owners can Add/Remove features of facility or update the hours of operation

Owners can respond to public reviews or feedback

Our Duties

1. Help users find with the best possible restroom

2. Provide restroom profiles that displays things such as:

   a. Current rating

   b. Types of amenities

   c. Most current or owner provided photo

3. Allow users to give real time feedback about restrooms

4. Provide owners with that real time constructive feedback

MFCD - Local Systems

- ▶ Local Storage will hold information such as:
  - ▶ Gender
  - ▶ Bathroom Preferences (Highest Rated, Most Reviews, Best Overall, etc. etc.)
- ▶ The local storage is used so that the user's personal data does not have to be kept on our DB thus saving the user from unwanted data leakage
- ▶ The mobile app will serve interfaces that allow users:
  - ▶ Rate bathrooms
  - ▶ Find bathrooms
  - ▶ Leave reviews
  - ▶ Owner of restrooms to see stats of their restrooms
  - ▶ See real time data such as: waits, ratings, and reviews
- ▶ Mobile app will be written in React Native

Local systems

Mobile App — Local Storage

AWS / Cloud Service

Backend

API Server

GIS   DB   Places Api
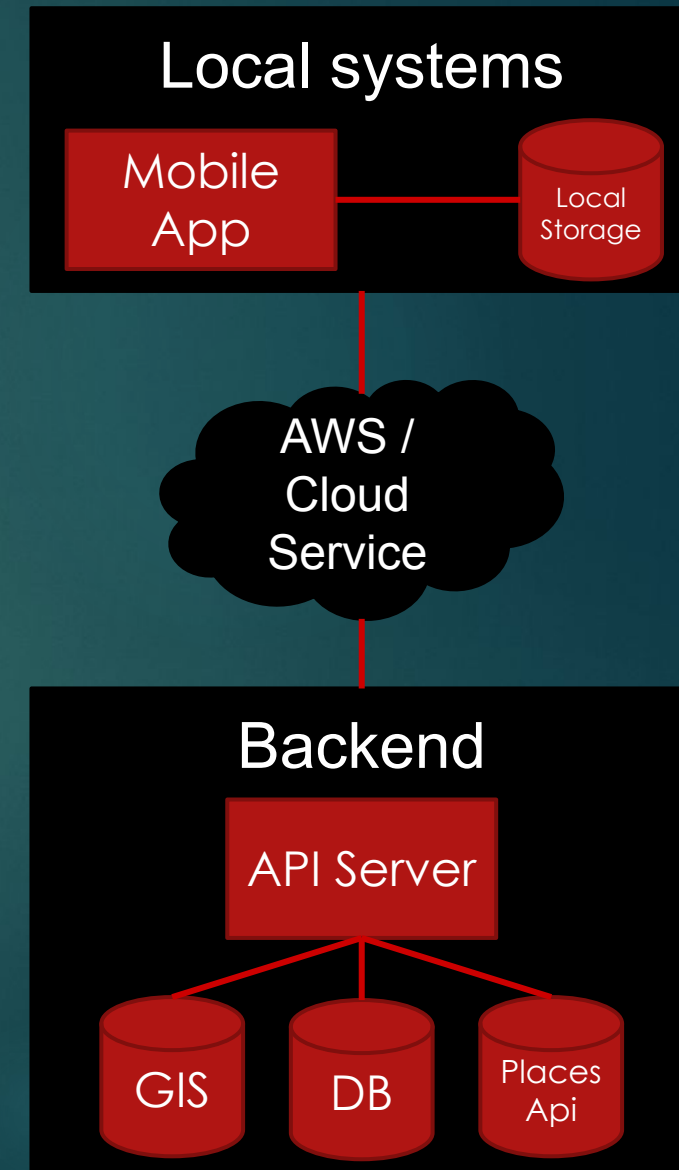
MFCD - Cloud

- ► Cloud system will be hosted in AWS
- ► AWS Features used:
  - ► DynamoDB: restroom ratings, place information, and minor user details
  - ► Api Gateway: access to the api service
  - ► Lambda: api call handling
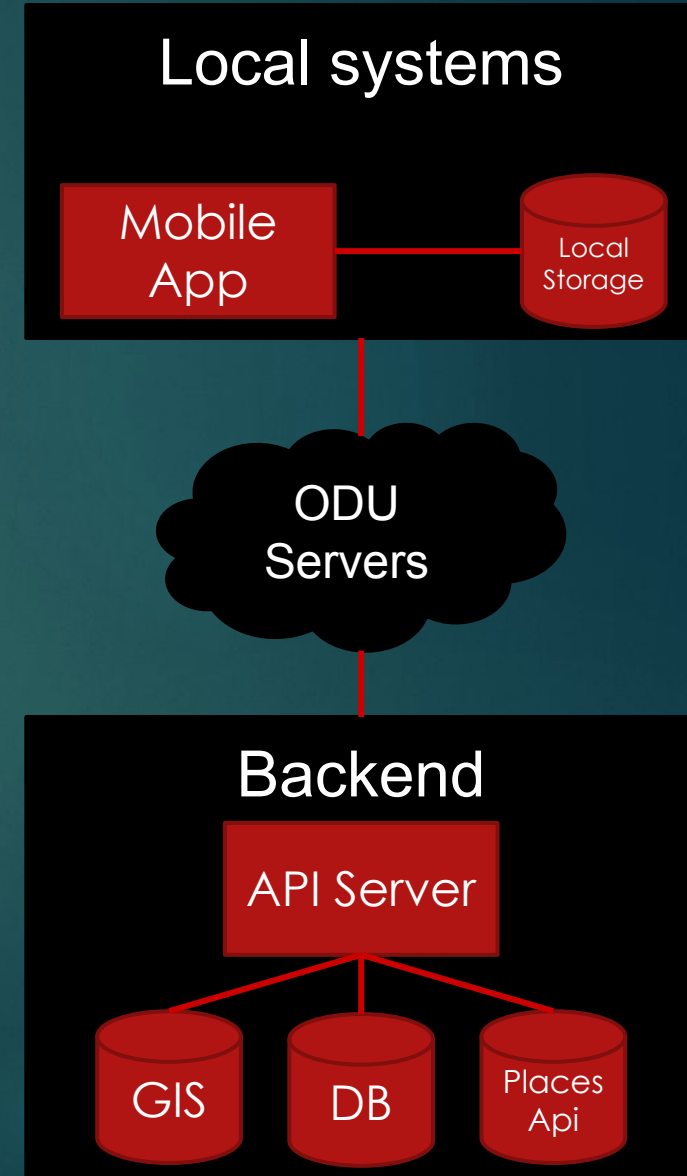- ► The AWS cloud system will hold all the virtualization needed for the backend

Local systems

Mobile App — Local Storage

AWS / Cloud Service

Backend

API Server

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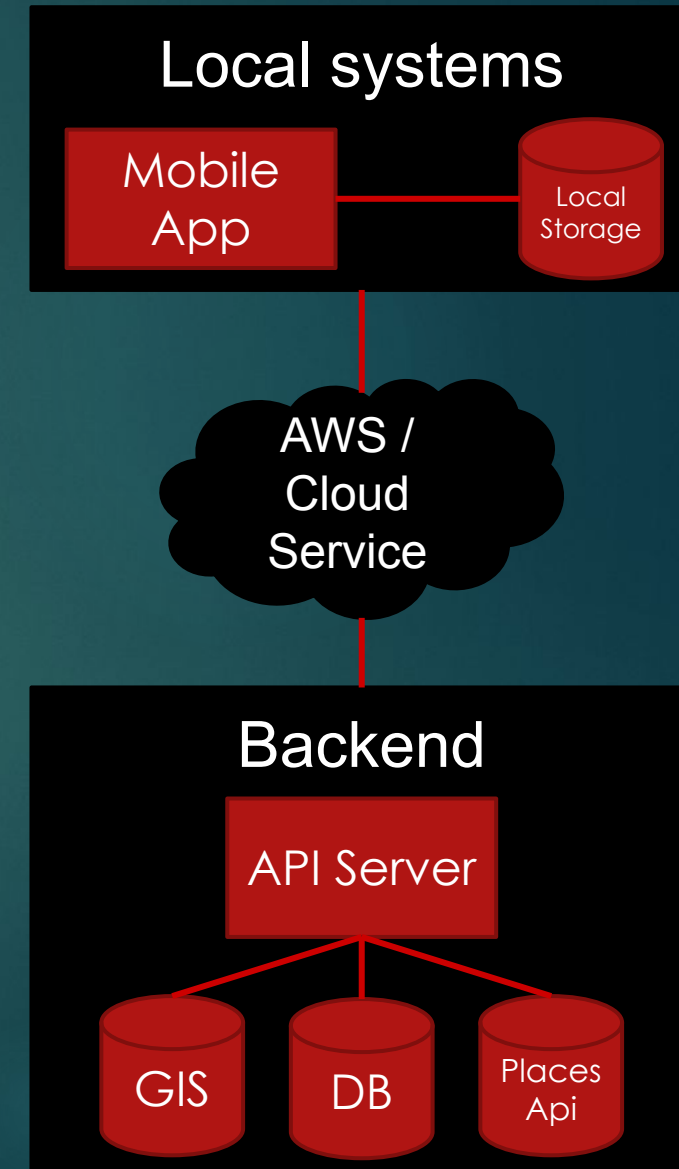
MFCD - Backend

► Lambda service using node.js and express.js will handle all the api calls

► Backend Db will be DynamoDB (no/sql) that will be accessible via AWS library

► Express app will have access to the GIS information given to us via Google's maps api

► We will also interface with Google's places api to get vital information such as:
  ► commercial locations
  ► recreational locations
 ► parks
  ► other "expected" restroom locations

Local systems

Mobile App

Local Storage

AWS / Cloud Service

Backend

API Server

GIS   DB   Places Api
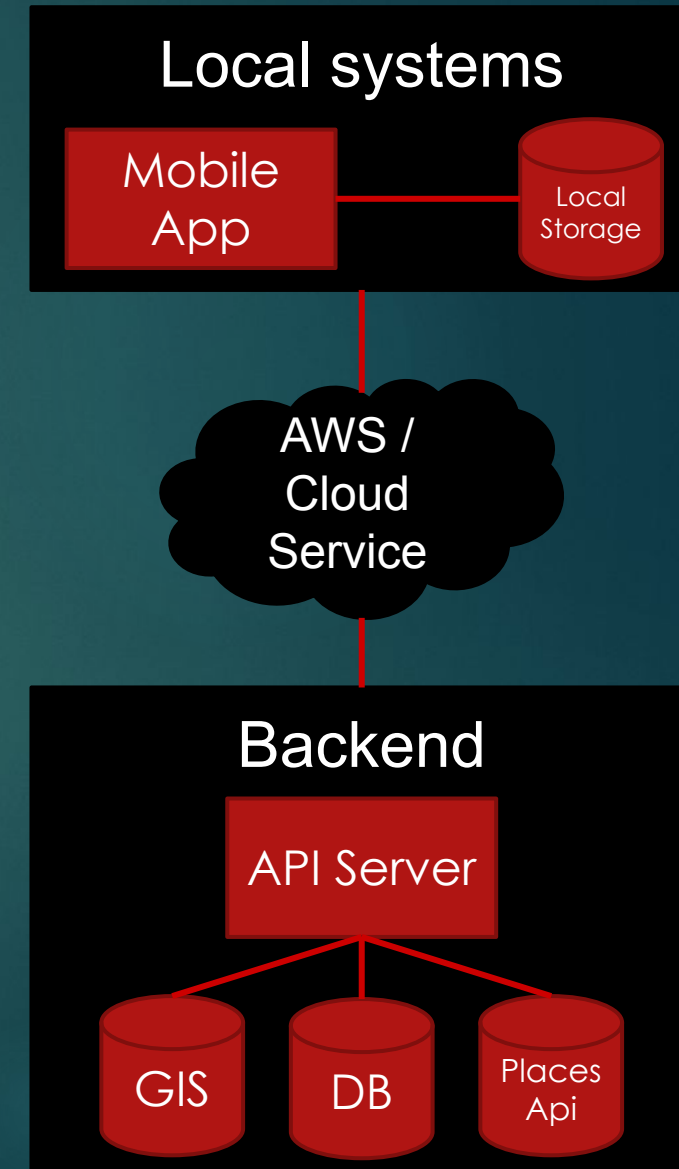
MFCD (Prototype)

► Interfaces we plan on doing:
   ► Rate bathrooms
   ► Find bathrooms
   ► Leave reviews
   ► Filters for finding a bathroom
   ► See real time data such as:
      ► waits
      ► ratings
      ► reviews
► Interfaces we do not plan on doing:
   ► Owner of restrooms to see stats of their restrooms
   ► User registration
   ► Owner Registration

Local systems

Mobile App — Local Storage

ODU Servers

Backend

API Server

GIS DB Places Api

MFCD (Prototype) – Local Systems

- Local Storage will hold information such as:
  - Gender
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Local systems

Mobile App — Local Storage

ODU Servers

Backend

API Server

GIS   DB   Places Api
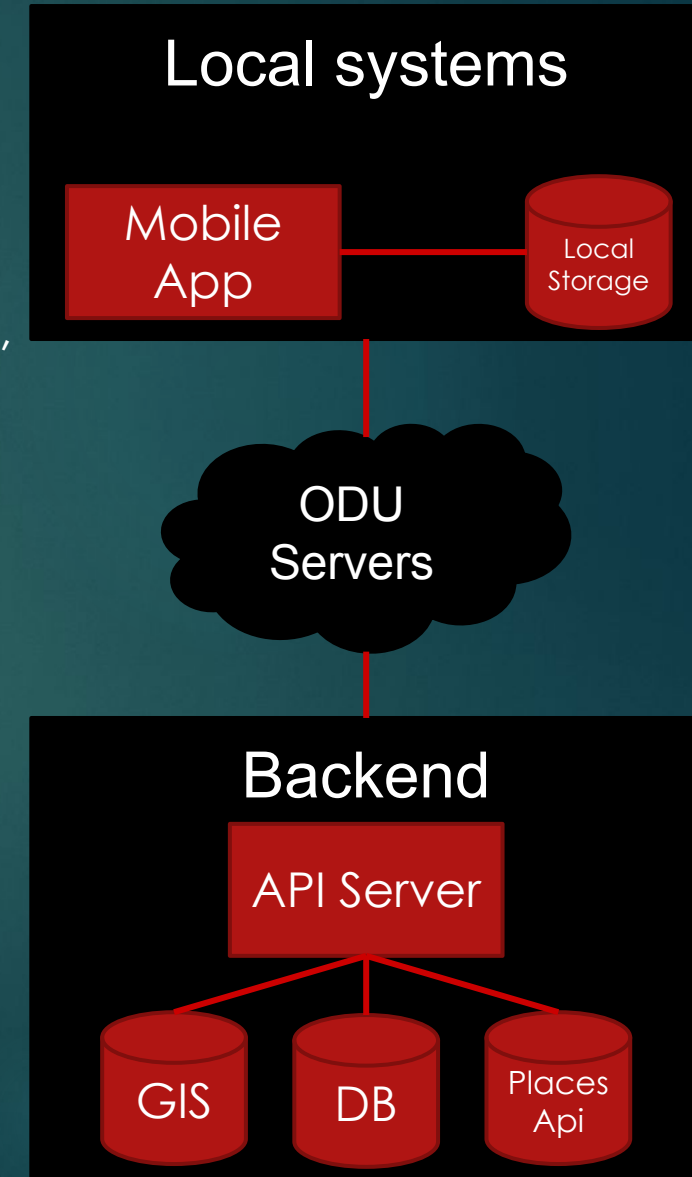
MFCD (Prototype) - ODU Servers

- Hosted by ODU
- Express app will live on ODU servers to serve data to mobile app
- It will also host a MongoDB to store and retrieve data

Local systems

Mobile App

Local Storage

ODU Servers

Backend

API Server

GIS

DB
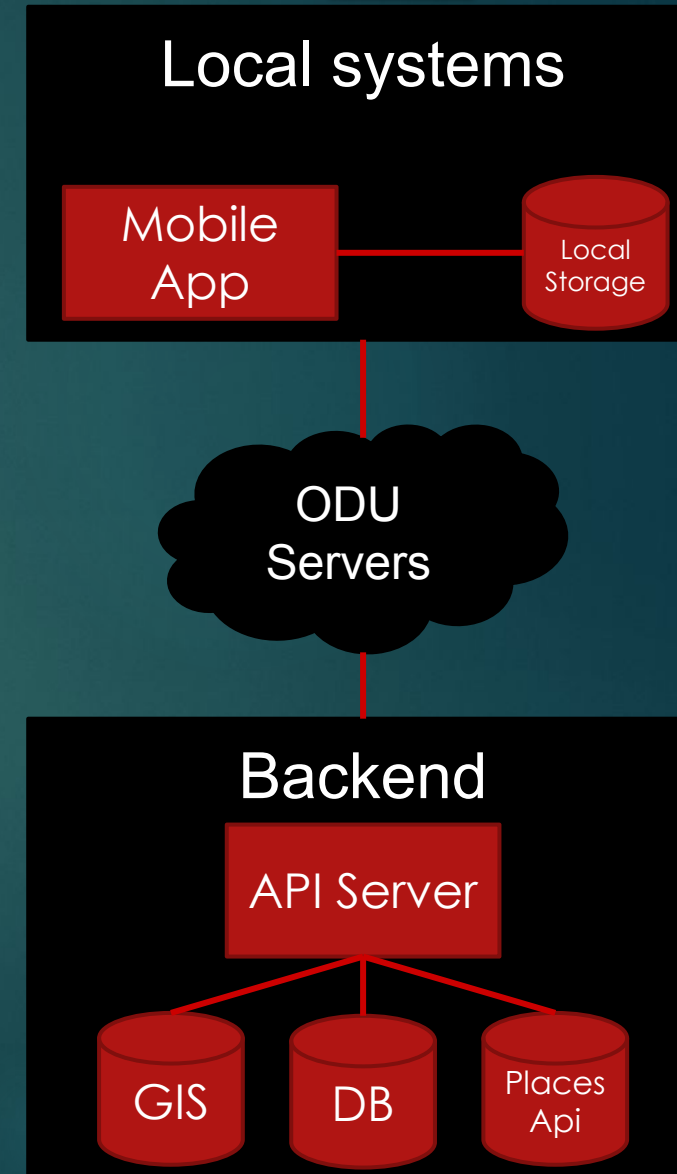
Places Api

MFCD (Prototype) - Backend

- ► Using node.js and express.js will handle all the api calls
- ► Backend Db will be MongoDB
- ► Express app will have access to the GIS information given to us via Google's maps api
- ► We will also interface with Google's places api to get vital information such as:
  - ► commercial locations
  - ► recreational locations
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  - ► other "expected" restroom locations

Local systems

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API Server

GIS   DB   Places Api
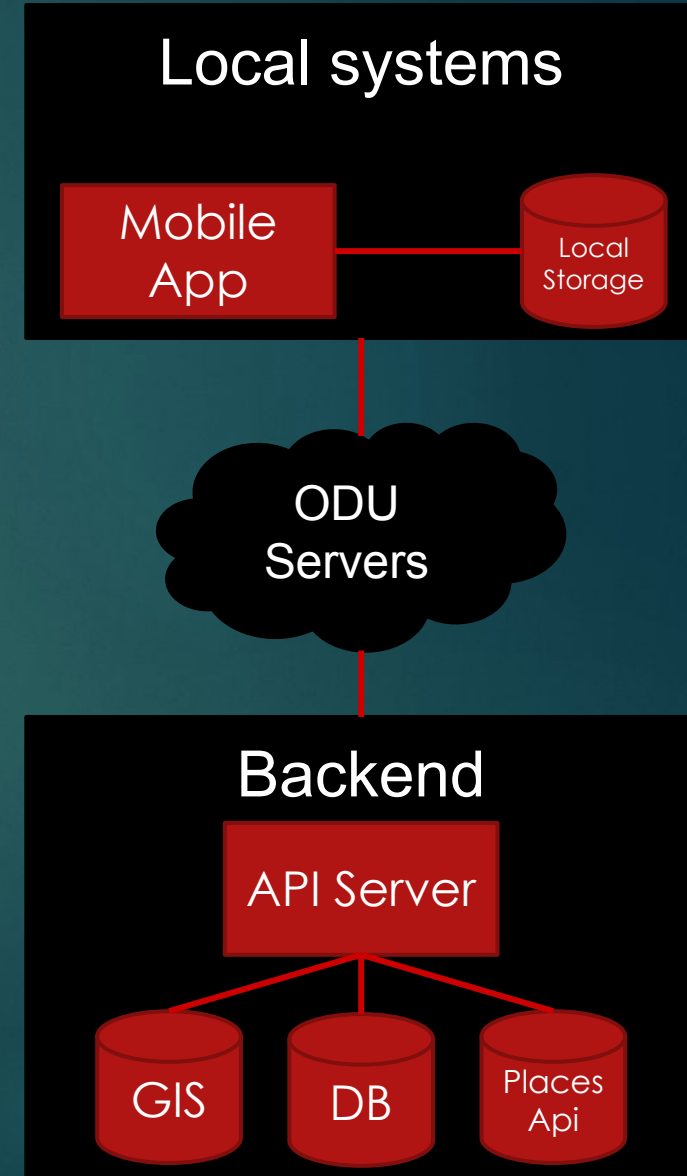
Competition Patron

	Patron					
Features	**Skadoosh**	**SitorSquat**	**Toilet Finder**	**Flush**	**Where to Wee**	**Bathroom Scout**
IOS	✓	✓	✓	✓	✗	✓
Android	✓	✓	✓	✓	✓	✓
Rating	✓	✓	✓	✗	✓	✓
Directions	✓	✓	✗	✓	✓	✓
Filter	✓	✓	✗	✗	✗	✗
Accessibility	✓	✓	✓	✓	✗	✓
Amenities	✓	✗	✗	✗	✗	✗
Free	✓	✗	✗	✗	✓	✗

Competition Owners

	Owners					
Features	Skadoosh	SitorSquat	Toilet Finder	Flush	Where to Wee	Bathroom Scout
Claim Business	✔	✘	✘	✘	✘	✘
Feedback to/from Customers	✔	✘	✘	✘	✘	✘
Add Restroom	✔	✘	✘	✘	✘	✘
Push Notification	✔	✘	✘	✘	✘	✘

Competition Real-Time

	Real-Time					
Features	Skadoosh	SitorSquat	Toilet Finder	Flush	Where to Wee	Bathroom Scout
Real-time Feedback	✔	✘	✘	✘	✘	✘
Real-time Rating	✔	✘	✘	✘	✘	✘
Real-time Notifications	✔	✘	✘	✘	✘	✘

Competition Cont.

- IOS / Android – app platforms

- Rating – allowing user to rate restroom

- Directions – Turn by turn navigation to restroom location

- Filter – allows user to filter map content based on applied criteria

- Accessibility – Handicap, gender, family

- Safe – tells the user if restroom is unsafe I.e. broken locks

- Free – application is free to use

- Amenities – shows restroom has changing station / supplies

Issues we can't unclog

1. Actual maintenance of restrooms

2. Impromptu janitorial services

3. Current visual representation

4. Real-time vacancies

Development Tools

Version Control : Git

Documentation : Jsdpc

Language : JavaScript and Swift

Library : Google's SDK

Framework : React native

WorkFlow : Agile

Database : DynamoDB

Development Model

Agile Methodology

Sprint 1:
- GUI
- User login/profile database
- Mapping and location database

Sprint 2:
- Rating database
- Notification algorithm
- Verified and Unverified restroom

Sprint 3:
- Refine and optimize application
- Add additional features

Mockups
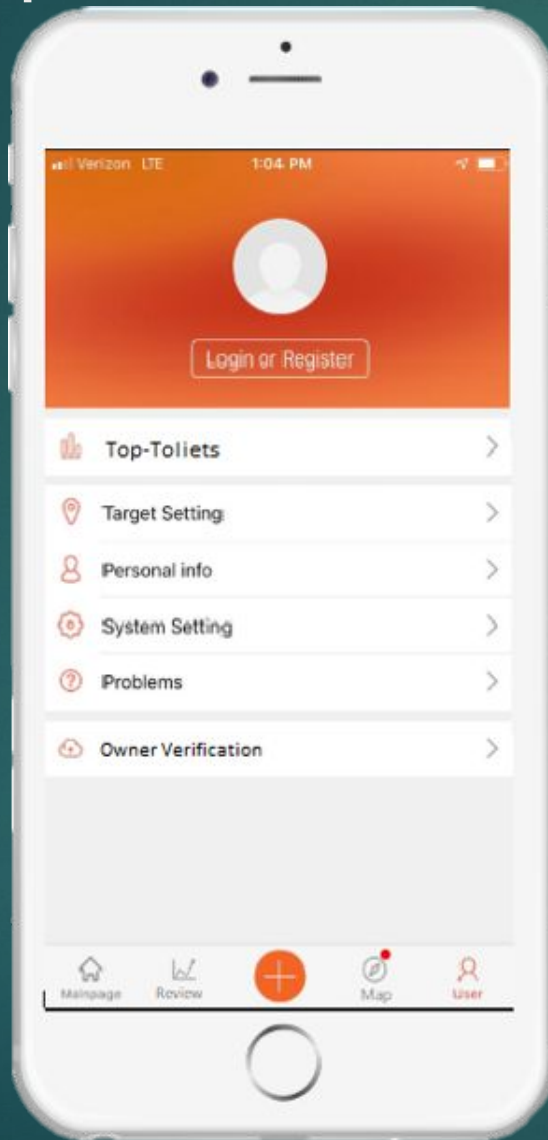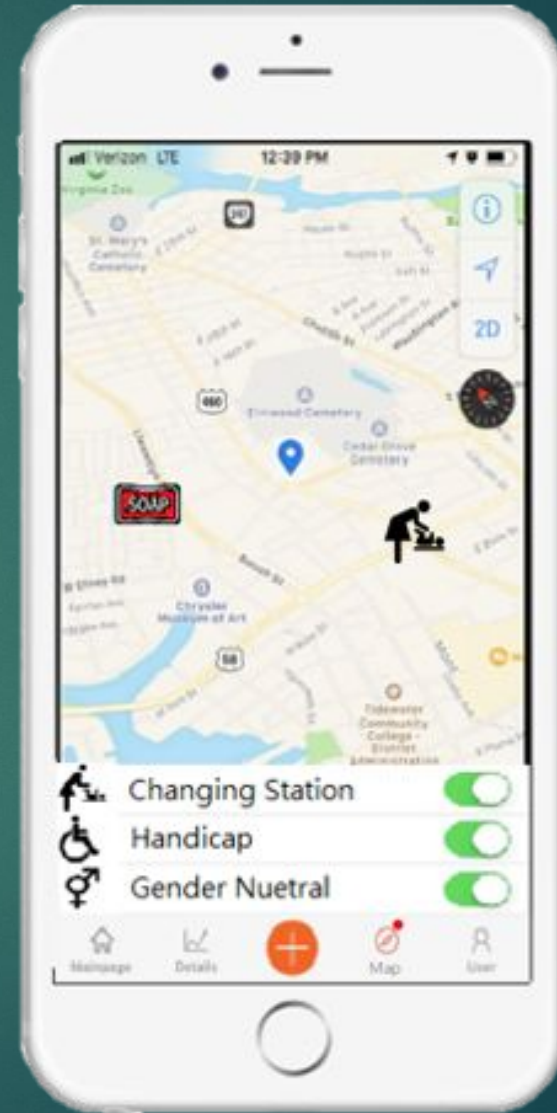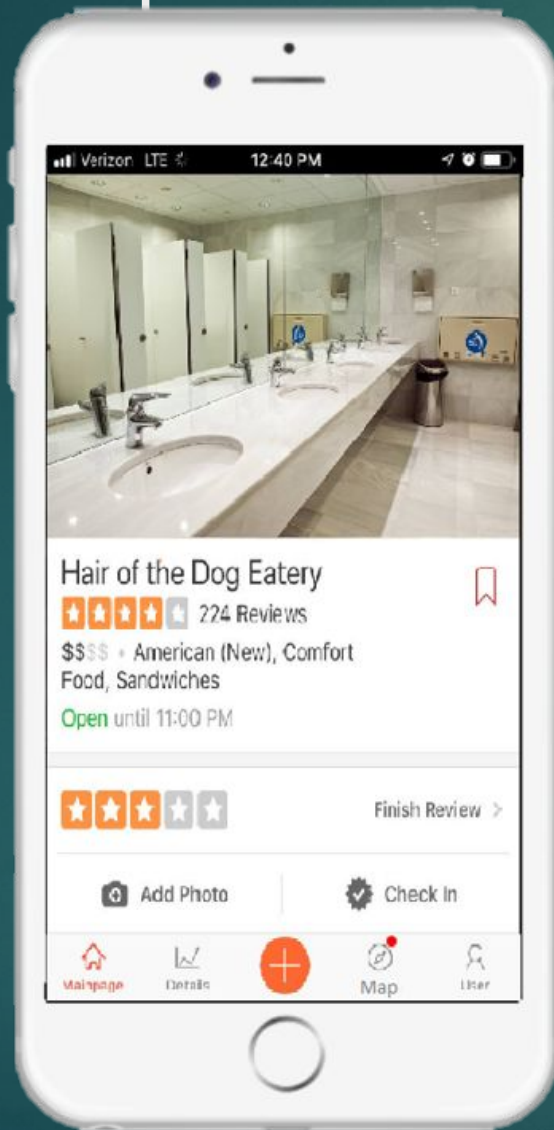
Mockups

Owner Mockups
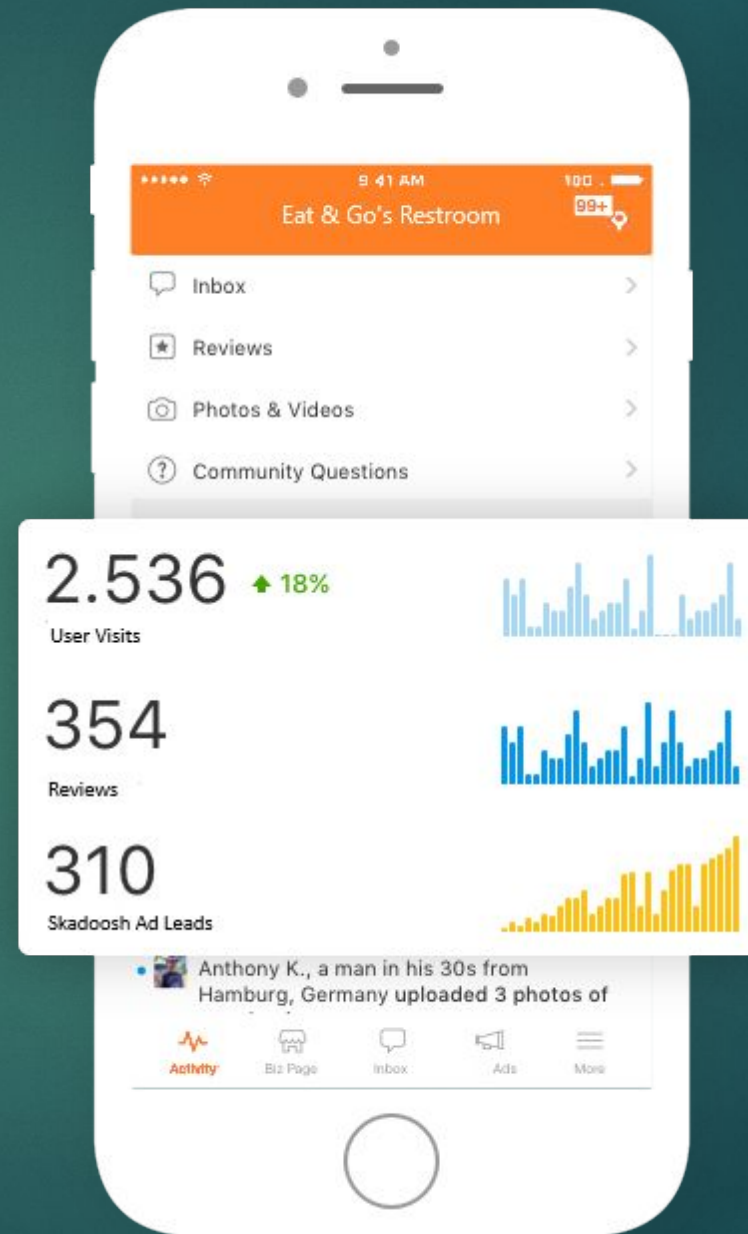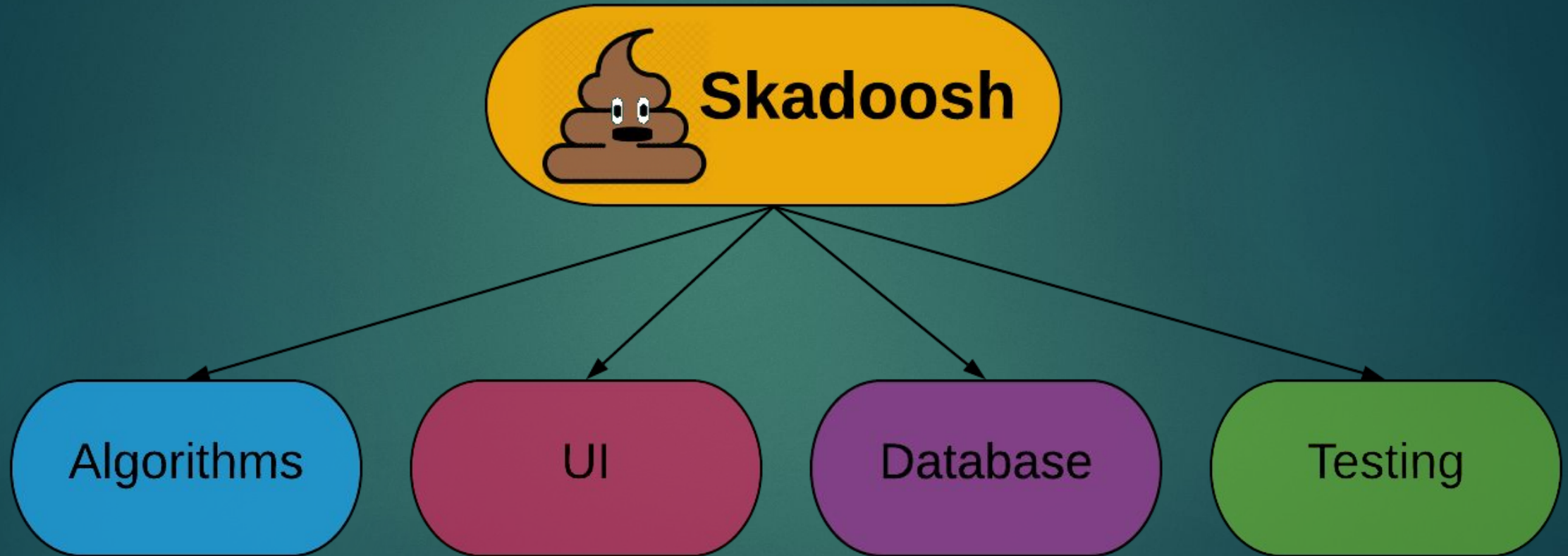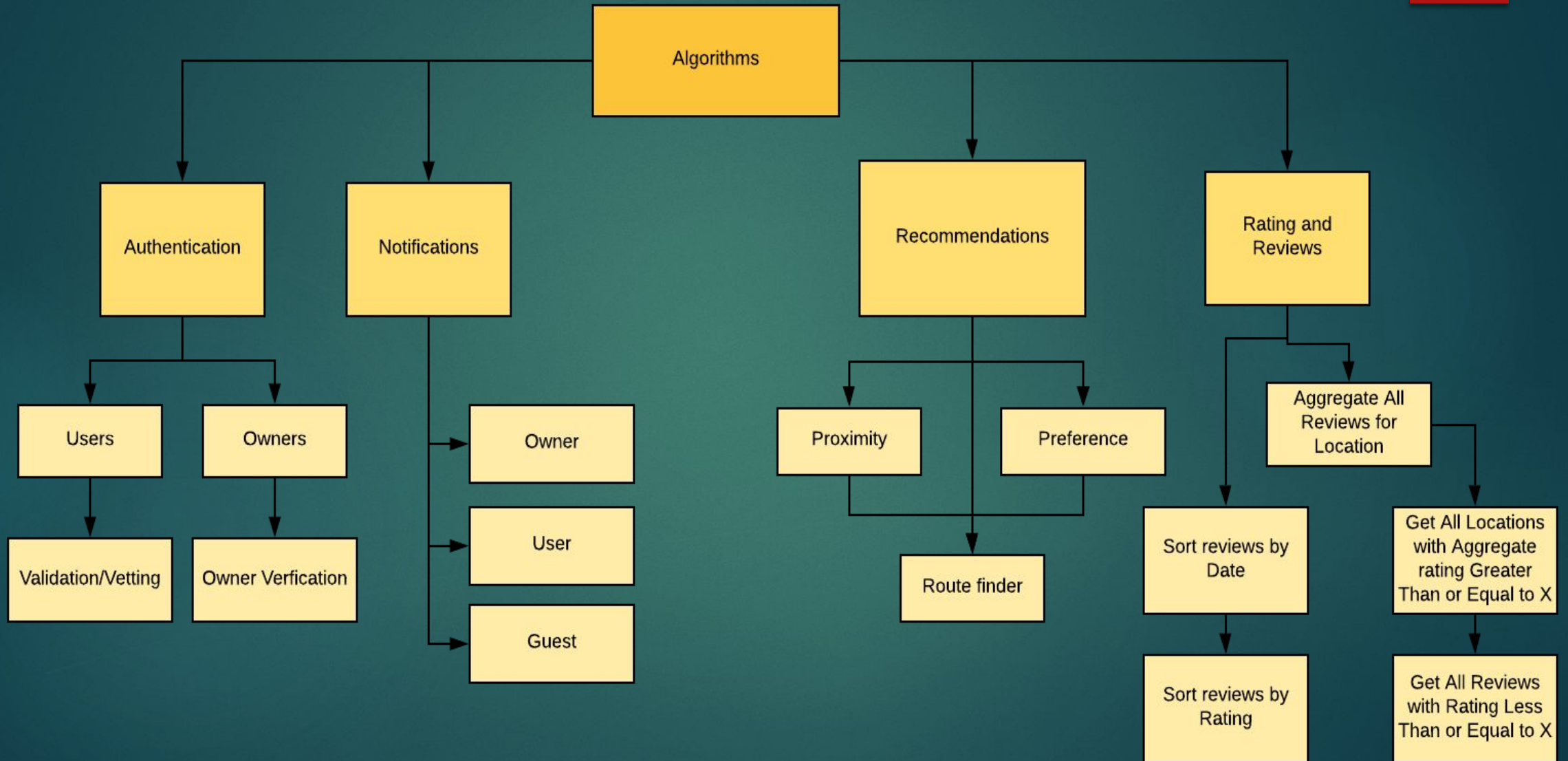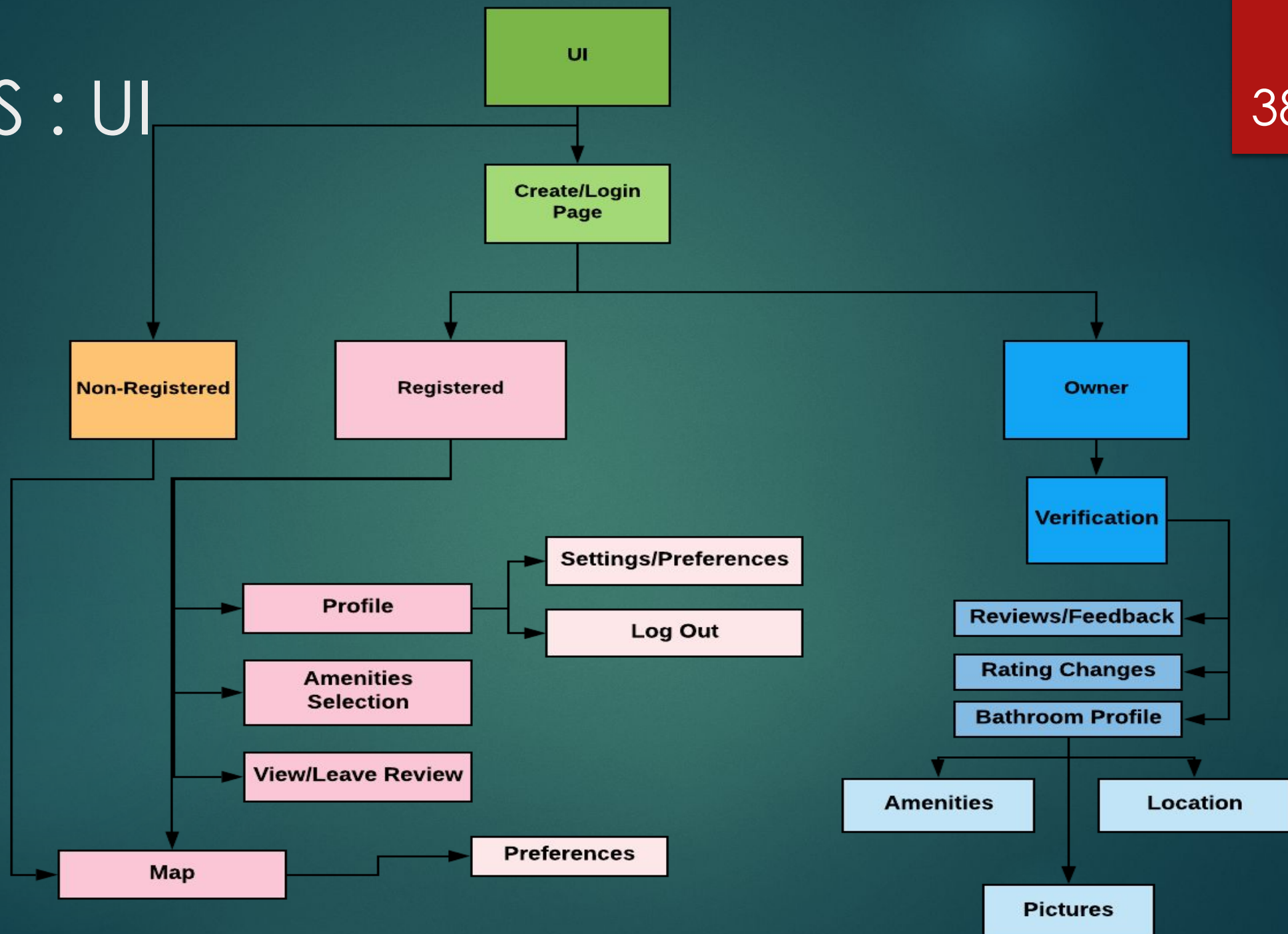
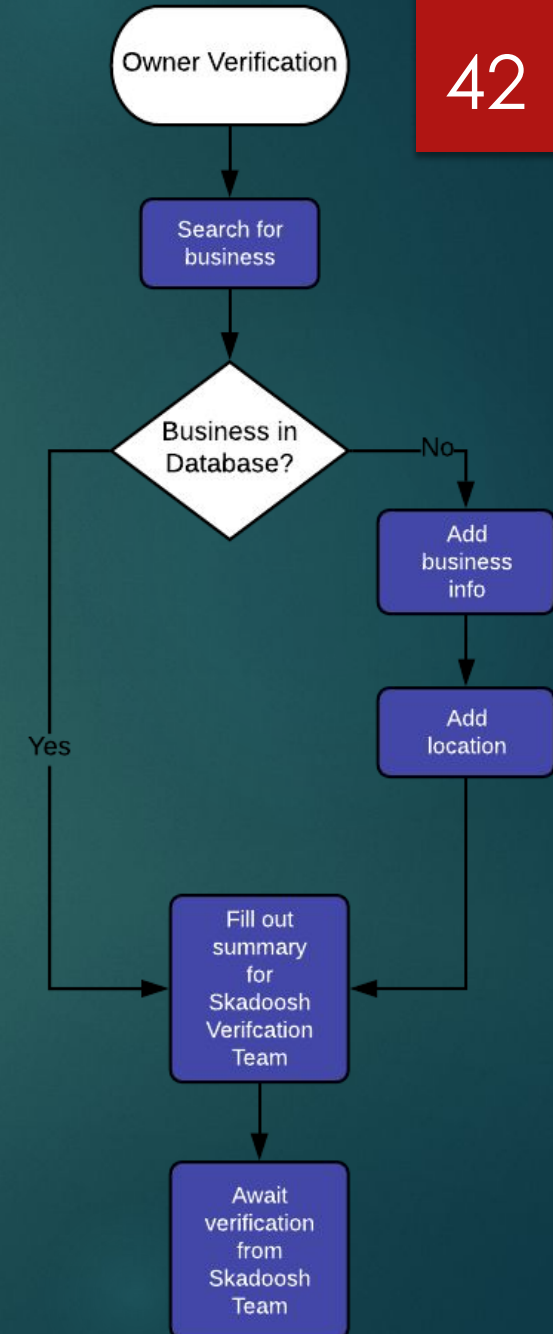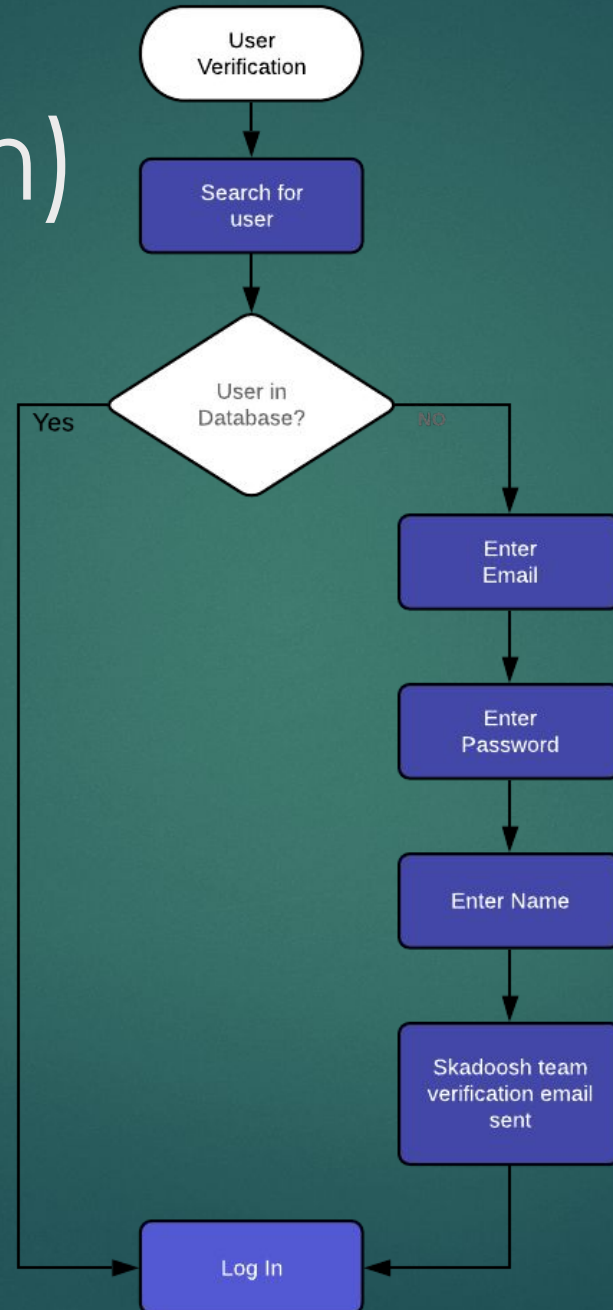# WBS : Testing
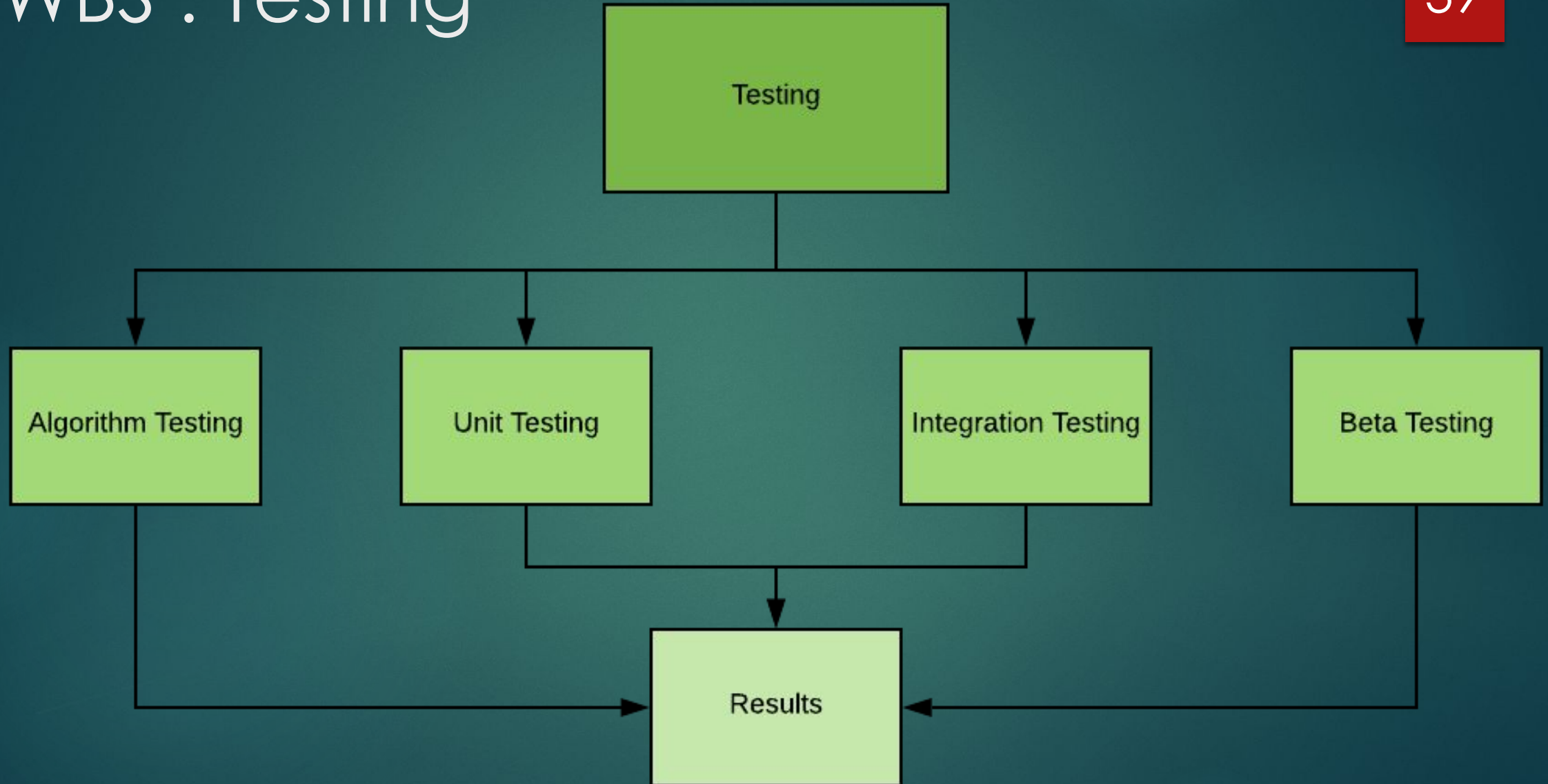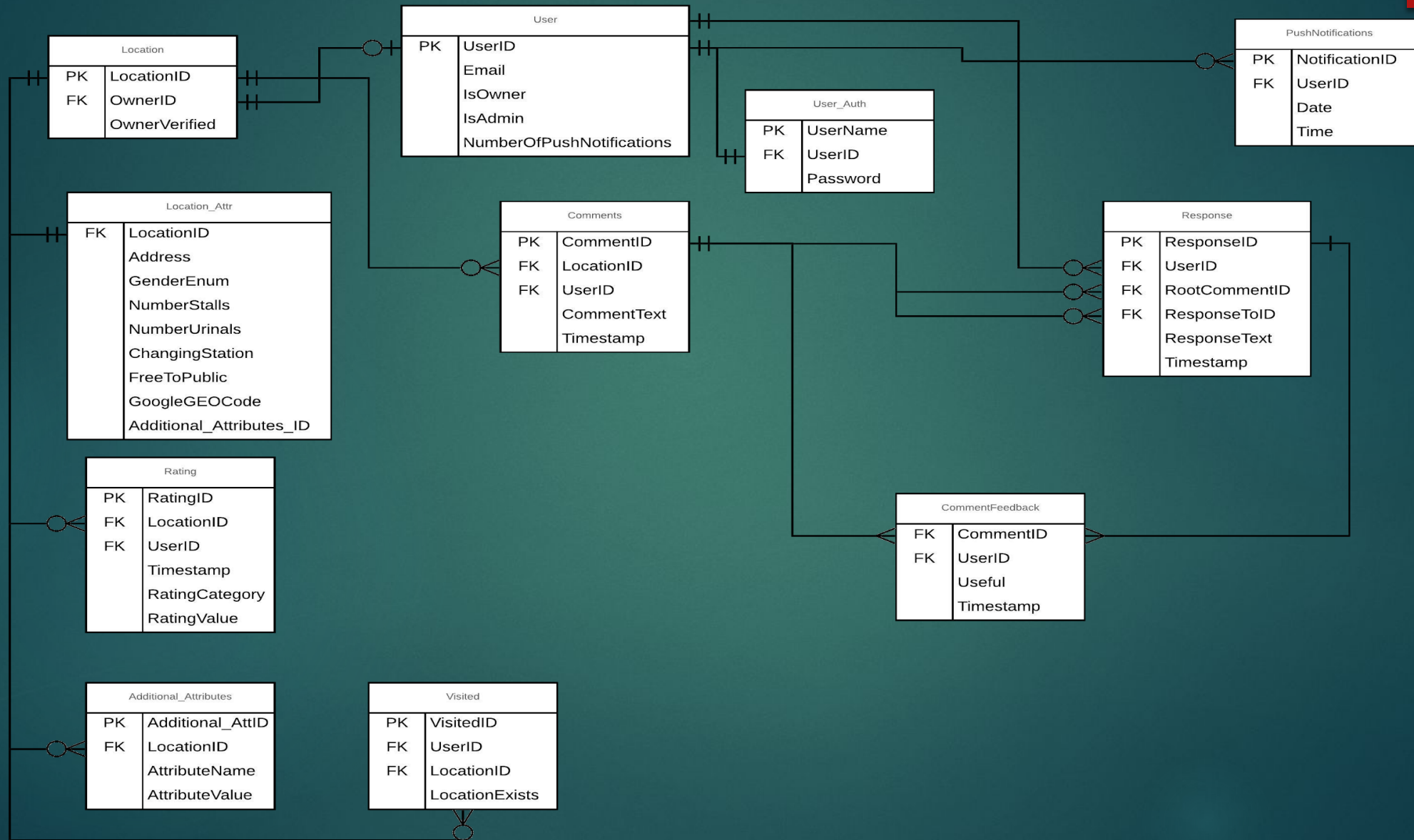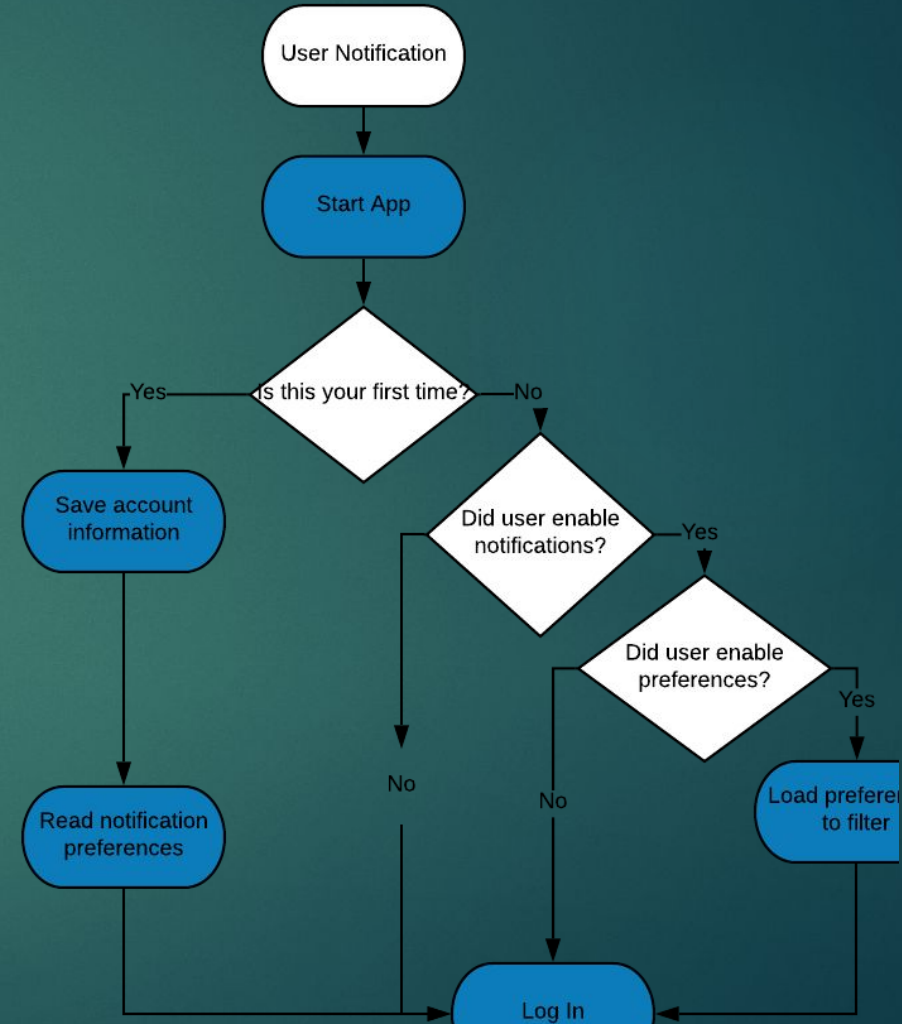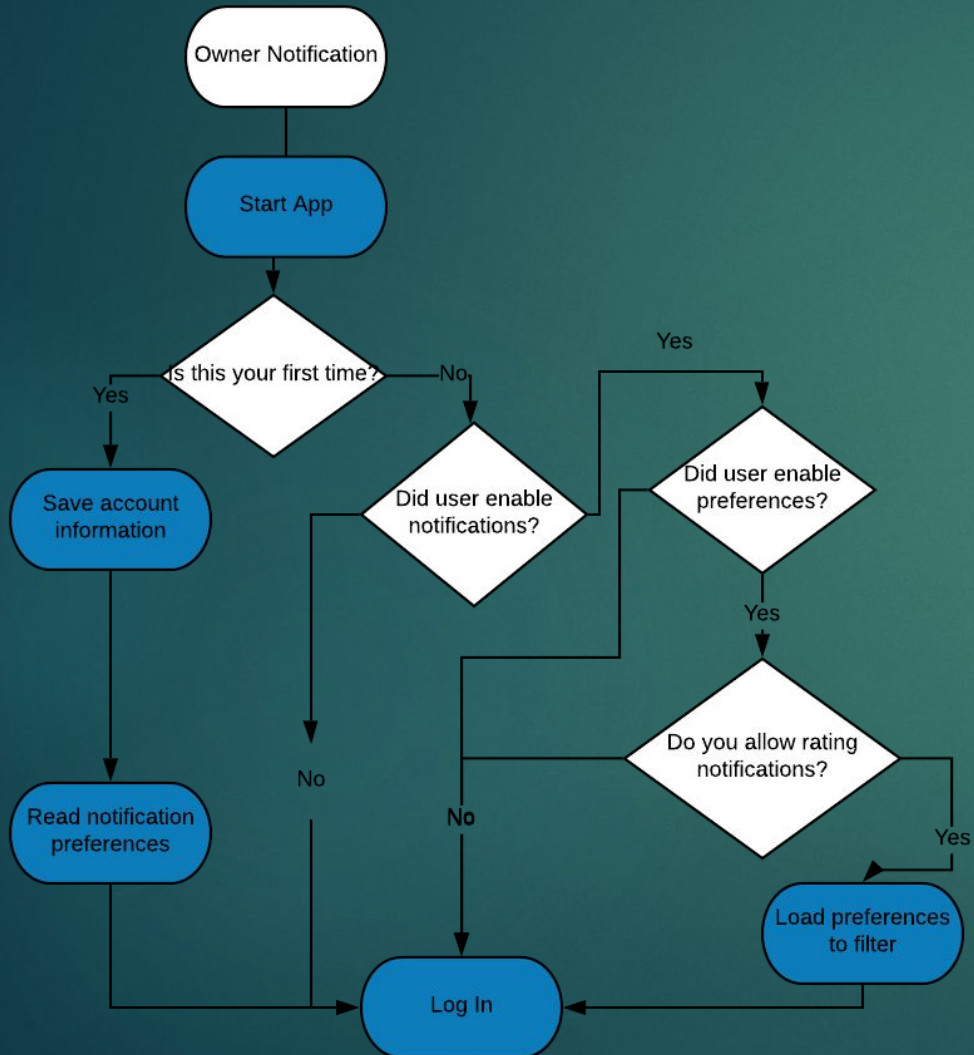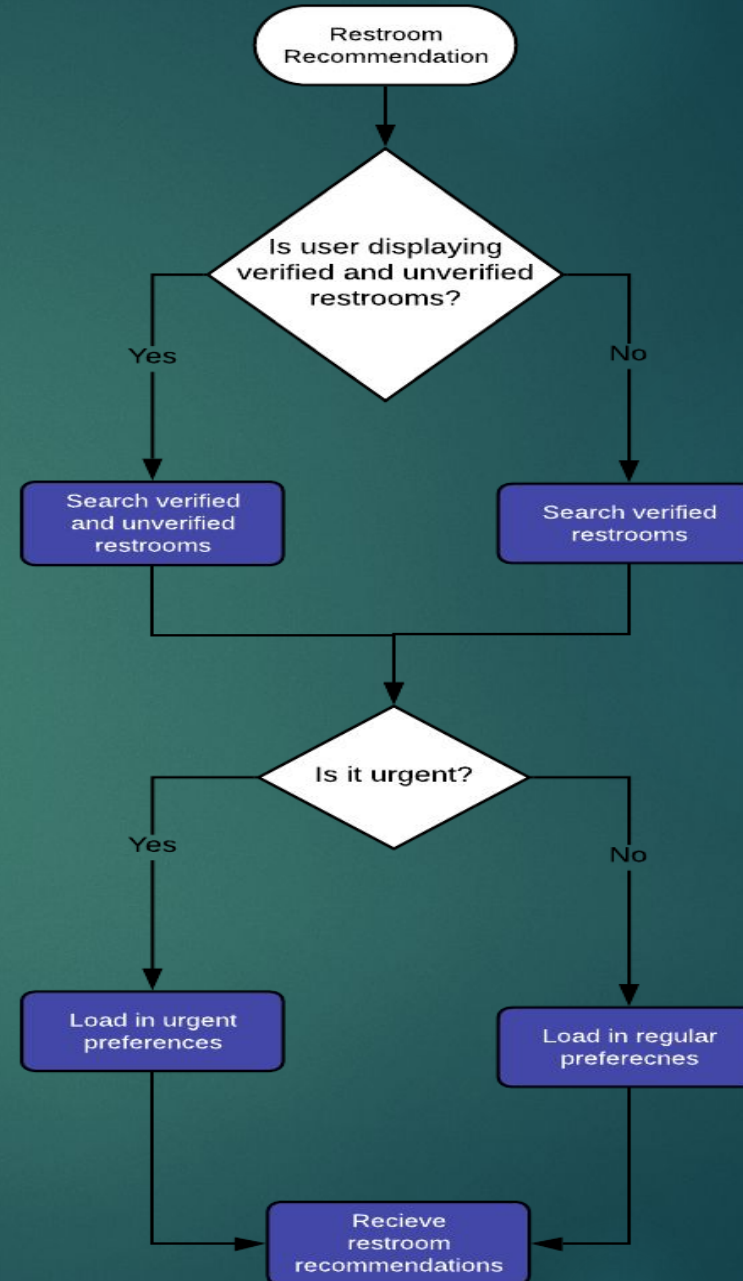
WBS: Database (Local XML)
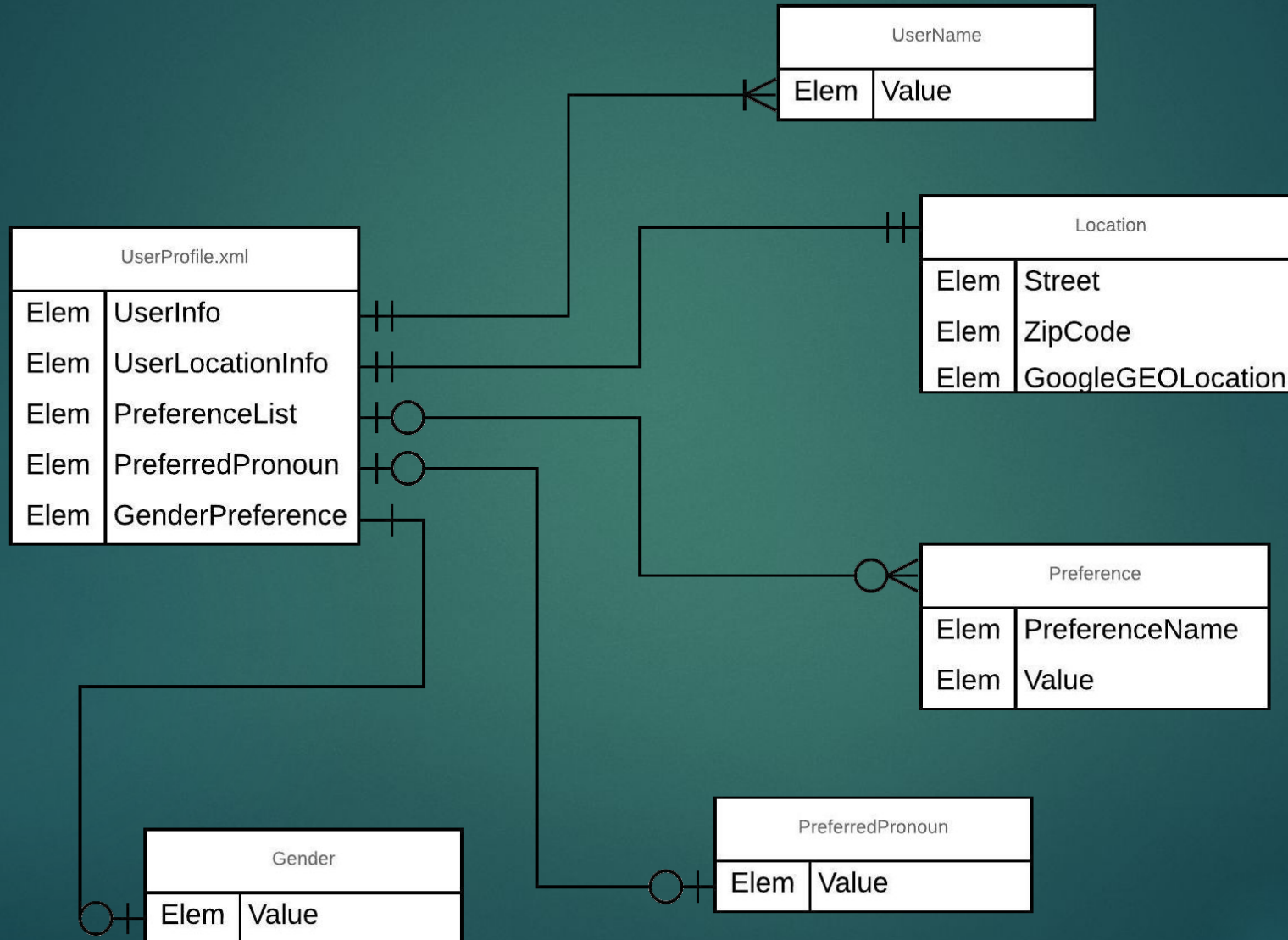
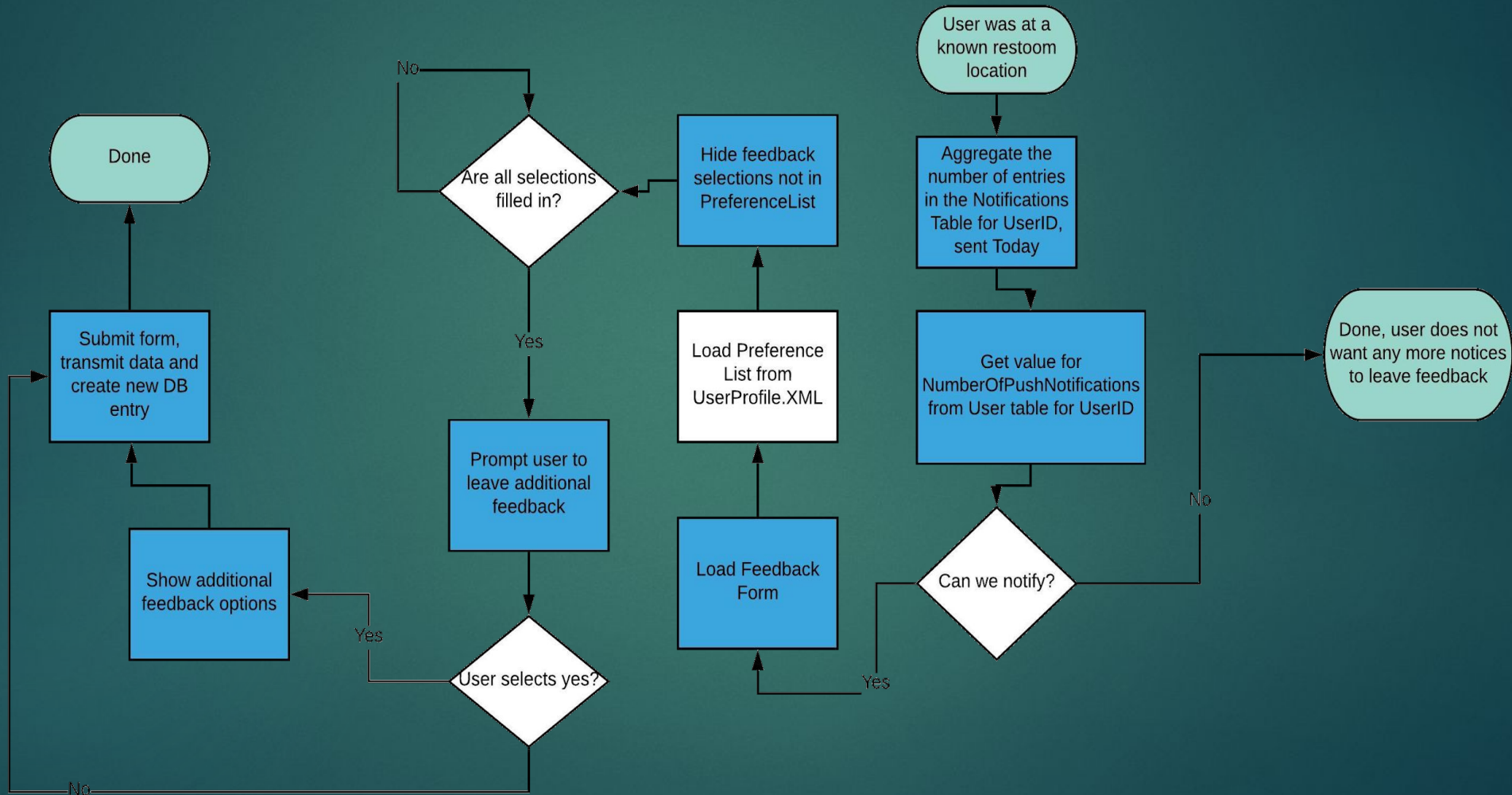# Logic Flows (Authentication)

Logic Flows (Notification)

Logic Flows (Recommendations)

Logic Flows (Feedback)
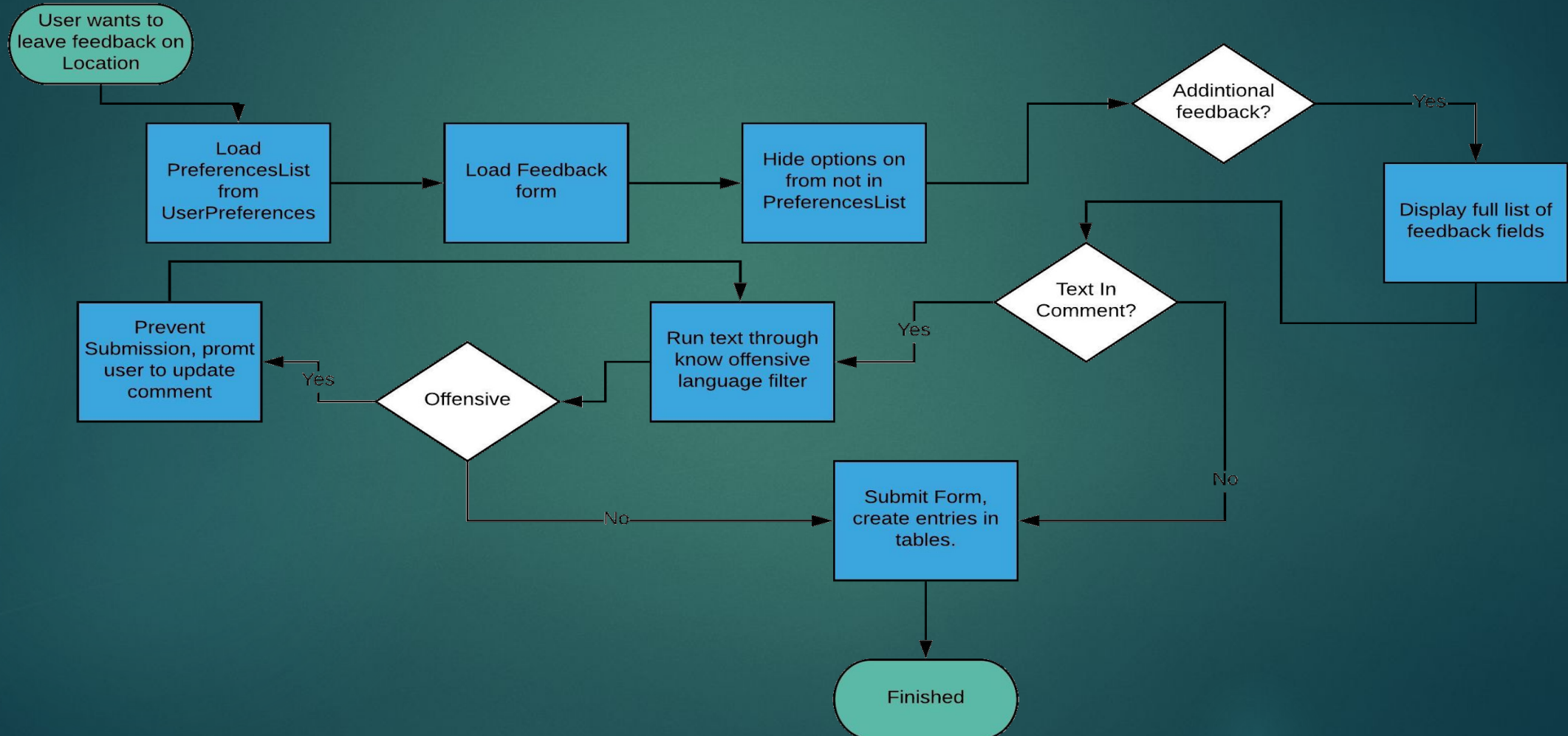
Risk Matrix

	Impact				
Likelihood	**Very Low**	**Low**	**Medium**	**High**	**Very High**
Very High	🟨	🟨	🟥	🟥	🟥
High	🟩	🟨	🟨	🟥	🟥
Medium	🟩 T-2	🟨 C-2	🟨	🟥	🟥
Low	🟩 T-1	🟩	🟨 C-1	🟨	🟥
Very Low	🟩	🟩	🟩 C-4	🟩 C-3	🟨 L-1

Legend

T- Technical Risk   C- Customer Risk   L- Legal Risk

T-1: The device OS is updated
T-2: Server is unable to handle the API usage

C-1: User misuse
- Users upload fake images
- Users don't leave any feedback
- Users leave malicious feedback

C-2: User reluctance to provide feedback

C-3: Location details are inaccurate

L-1: Non-Owner locations deter customers from using facility

Technical Risk T-1

Likelihood \ Impact	Very Low	Low	Medium	High	Very High
Very High					
High					
Medium	T-2	C-2			
Low	T-1		C-1		
Very Low			C-4	C-3	L-1

Legend

T- Technical Risk   C- Customer Risk   L- Legal Risk

Risk
The device OS is updated and breaks the app function

Mitigation
Continual testing to make sure updates are not breaking app function. Usually beta programs or developer accounts are available to help developers prepare for OS releases

Technical Risk T-2

		Impact				
		Very Low	Low	Medium	High	Very High
Likelihood	Very High					
	High					
	Medium	T-2	C-2			
	Low	T-1		C-1		
	Very Low			C-4	C-3	L-1

Legend

T- Technical Risk   C- Customer Risk   L- Legal Risk

Risk
Server is unable to handle the API usage as the user base grows, performance degrades

Mitigation
Consult AWS to ensure the application scales with the growth of users

Customer Risk C-1

	Impact				
Likelihood	**Very Low**	**Low**	**Medium**	**High**	**Very High**
Very High	🟨	🟨	🟥	🟥	🟥
High	🟩	🟨	🟨	🟥	🟥
Medium	T-2	C-2	🟨	🟥	🟥
Low	T-1	🟩	**C-1**	🟨	🟥
Very Low	🟩	🟩	C-4	C-3	L-1

Legend

T- Technical Risk   C- Customer Risk   L- Legal Risk

Risk

Uer mis-use
- Upload fake/inappropriate images
- Doesn't leave feedback
- Leaves malicious feedback

Mitigation

Push notifications to reminds users to leave feedback. User voting strategy on images and reviews. Users can won't be allowed to up-vote their own images or reviews

Customer Risk C-2

Risk
Users may be reluctant to provide feedback.

Mitigation
Allows registered users to post under anonymous

Legend

T- Technical Risk   C- Customer Risk   L- Legal Risk

Customer Risk C-3

		Impact				
		Very Low	**Low**	**Medium**	**High**	**Very High**
Likelihood	**Very High**					
	High					
	Medium	T-2	C-2			
	Low	T-1		C-1		
	Very Low			C-4	C-3	L-1

Legend

T- Technical Risk   C- Customer Risk   L- Legal Risk

Risk
Owner misrepresentation
-Incorrect location
-Incorrect picture
-Incorrect amenities

Mitigation
Allow users to report incorrect details and delete accounts with too many reports

Customer Risk C-4

Legend

T- Technical Risk   C- Customer Risk   L- Legal Risk

Risk

Excessive notifications could cause users to become agitated and/or delete the app

Mitigation

We will implement our notification algorithm

Legal Risk L-1

Legend

T- Technical Risk   C- Customer Risk   L- Legal Risk

Risk

Non-Owner locations deter customers from using facility and owners see a marked revenue drop. They decide to take legal action against skadoosh

Mitigation

Make all users agree to a terms of service.

User Stories (Guests/Non-Registered User)

As a guest/non-registered user, I need to:

- See a login/sign up page
- Create a non-owner and owner profile account
- Choose a restroom
- View ratings and reviews
- See Skadoosh verified/approved bathrooms
- Be prompted to register when attempting to leave a review

User Stories (Non-Owners)

As a Non-owner, I need to:

- Login
- Create/View my profile
- set my username/info
- Receive notifications
- Create a list of preferences based on:
    - Cleanliness
    - Amenities
        - Type of toilet paper(if applicable)
        - Hand Towels or hand dryer(if applicable)
    - Gender neutrality
    - Baby-changing stations
- Edit my preferences
- Find restroom based on my preferences
- Have multiple preference profiles
- Have the option for default preferences and find the closest restroom as quickly as possible (Urgent)

As a Non-owner, I wish to:

- Set gender
- Add unverified restroom to map
- View unverified restrooms created by other users (at their own risk)
- Only view Skadoosh approve owner operated restrooms
- View pictures of a restroom
- Add pictures of a restroom
- See what type of amenities a bathroom contains

User Stories (Owners)

As an Owner I need to:

- Get my business Skadoosh verified
- Add my restroom to the map
- Comment/respond to reviews/feedback
- Display information about my bathroom
- Hours of operation
- Amenities
- Type of toilet paper
- Hand towels or hand dryers
- Update my restroom profile
- Receive notification if my restroom gets a bad review or goes under a certain rating

As an Owner I wish to:

- Receive data analytics
- Filter data to assist with creating a janitor schedule
- Filter data to view peak hours
- Advertise my business
-

User Stories (Administrators)

As an Administrator, I need to:

- ► Manage owner and non-owner accounts
- ► Suspend or delete accounts
- ► Verify businesses to have an owner account
- ► Verify unverified restroom
- ► Prepare notifications to be sent to registered users
- ► Send user notifications
- ► Delete restroom locations
- ► Delete false reviews
- ► Delete owner feedback

As an Administrator, I wish to:

- ► Upgrade owner accounts
- ► Manage advertisements for owner accounts
- ► Manage top Skadoosh rated restroom list

In Conclusion

- ► Anyone can struggle with finding the "right" bathroom

- ► We offer our users real-time feedback to amend this problem

- ► We crush our competition with the usage of reliable real-time feedback and owner interfaces

- ► Some might say Skadoosh is coming to flush out all the competition

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Skadoosh it !

Glossary

Skadoosh It - #1 Toilet Finder

API - Application Programming Interface

UI - User Interface

AWS - Amazon Web Service

DB - Database

Amenities - A wanted or practical feature to a facility

OS - Operating System

GIS - Geographic Information Systems

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