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

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DB Engineer

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Web Developer

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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

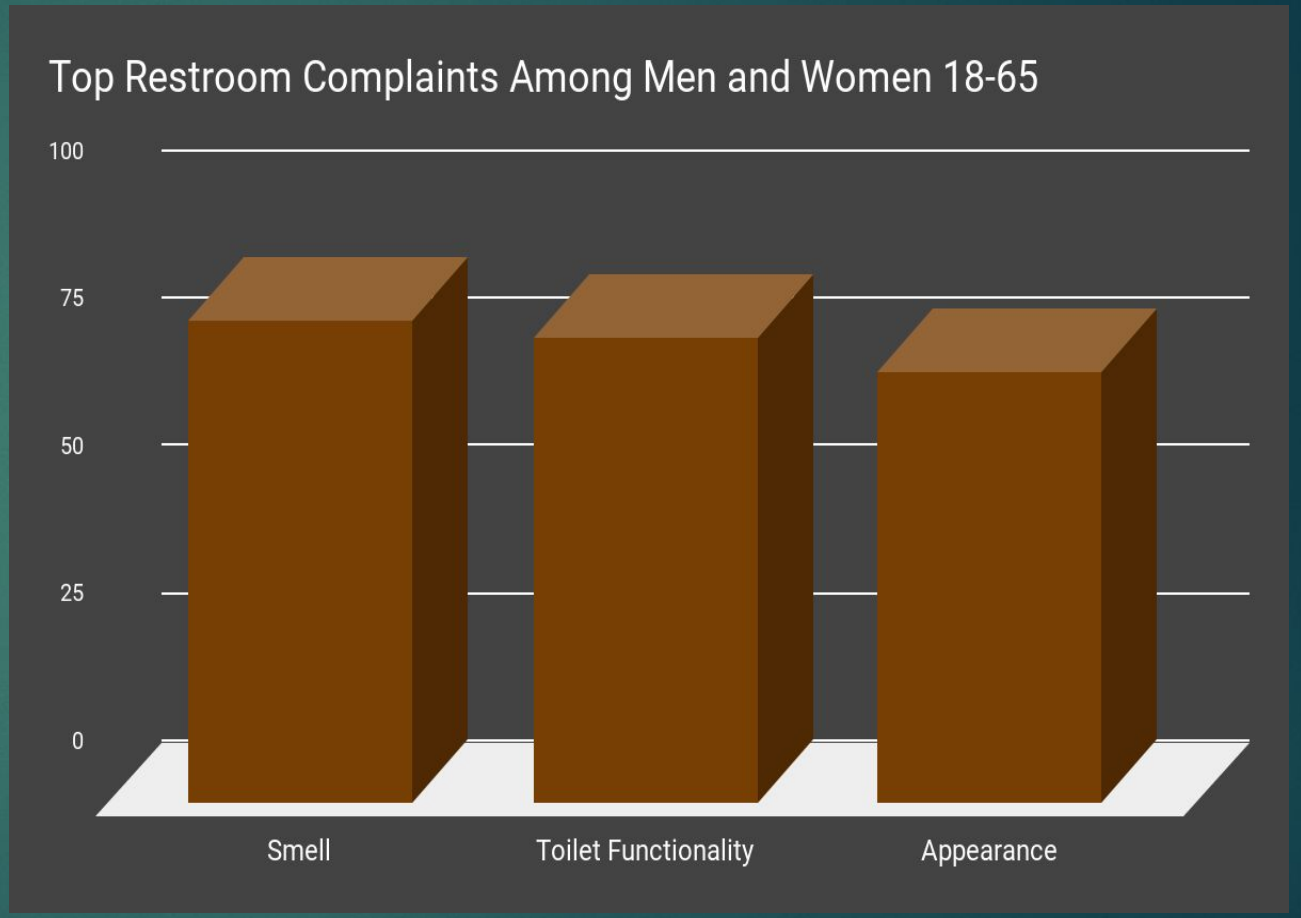
[2] Enviro-Master

[3] Theconversation

Top Complaints

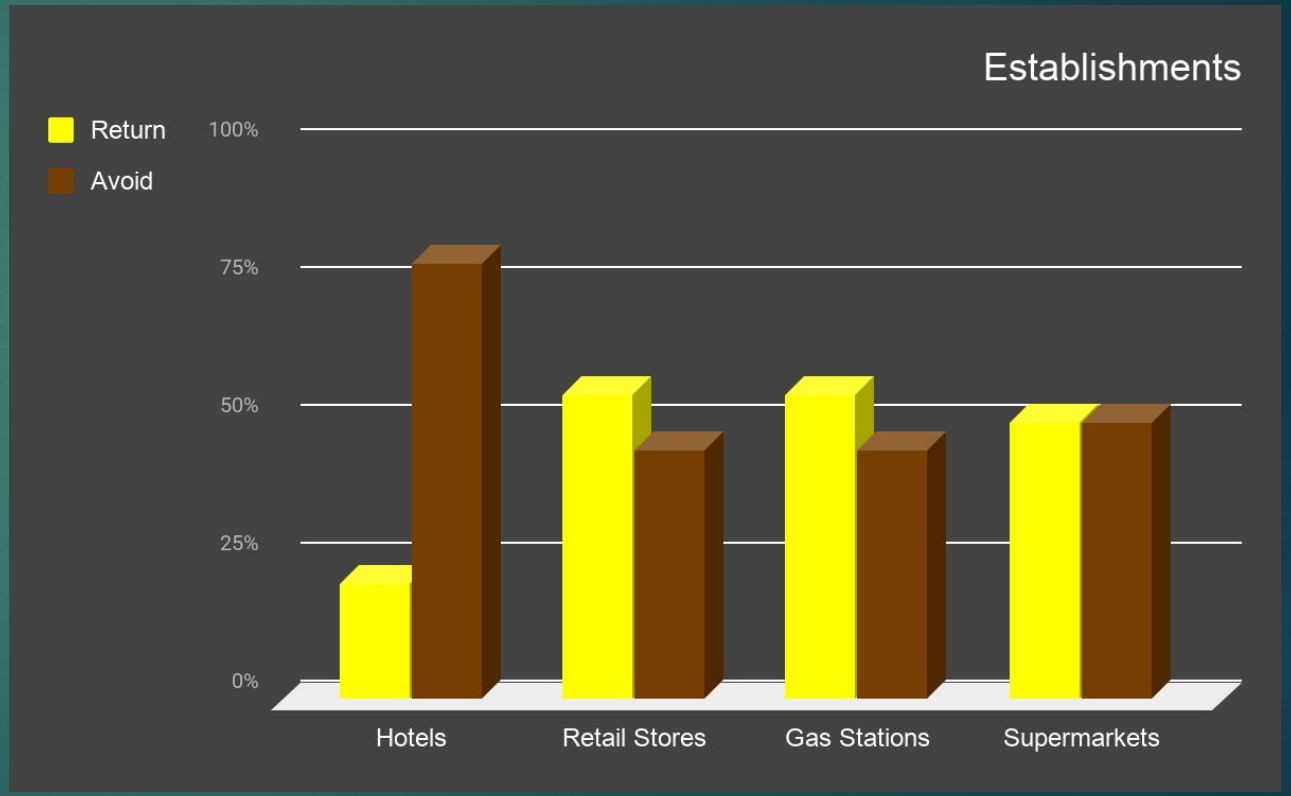
Survey by The Bradley Corporation [1]

[1] PR-Newswirem



Coming back?

- Among the survey, the following locations were asked about

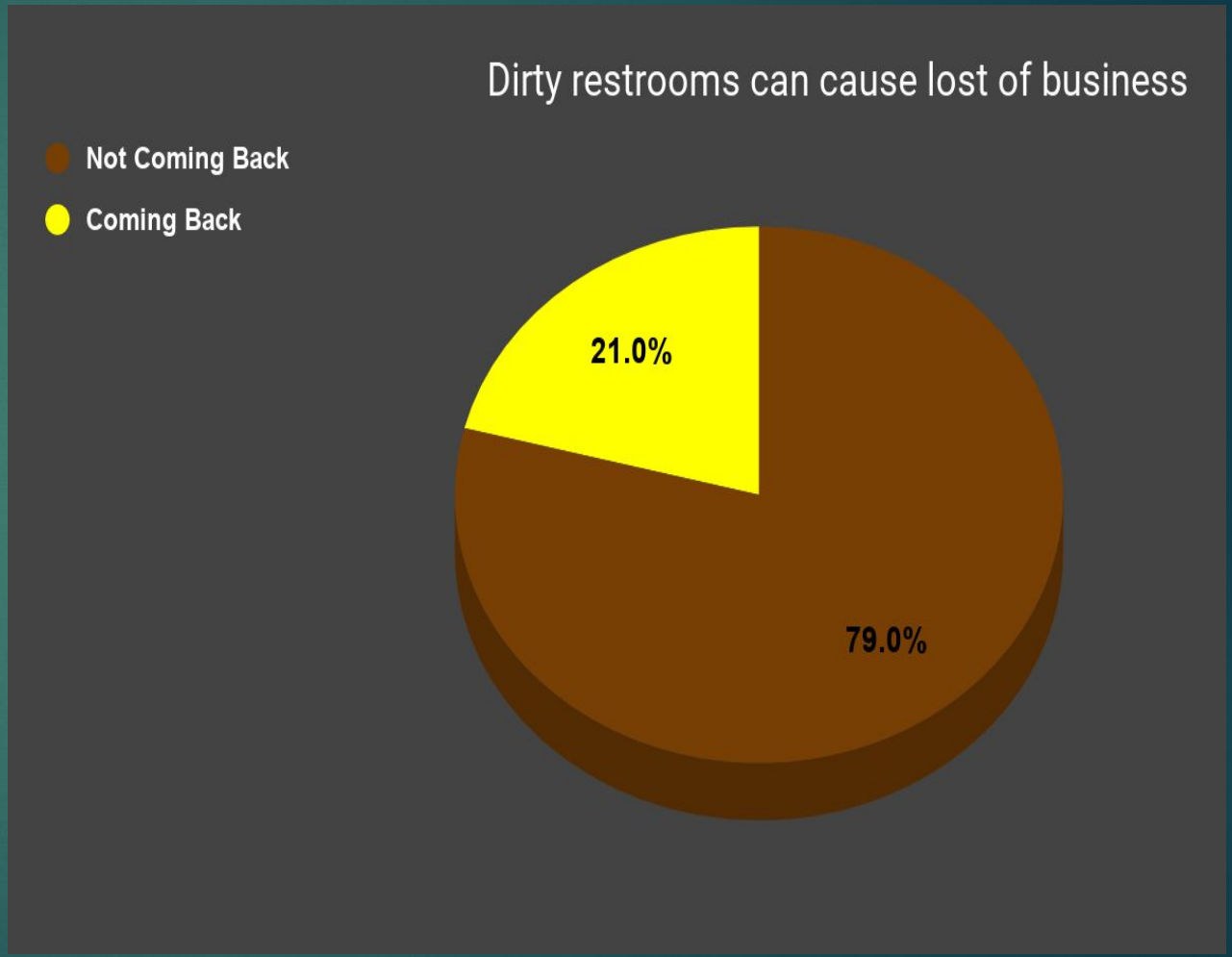


Survey by the Clintas Corporation

Clintas Corporation

Bathroom Cleanliness Affects Businesses

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



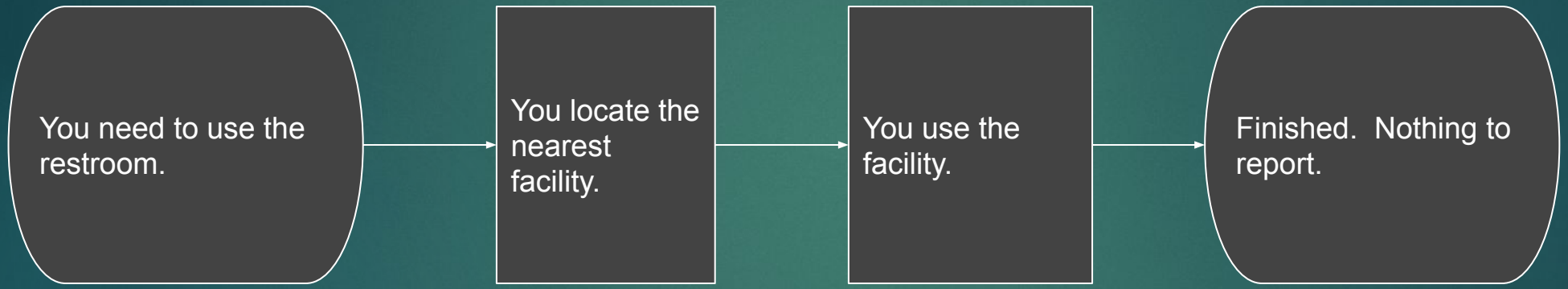
Survey by the Clintas Corporation

Clintas Corporation

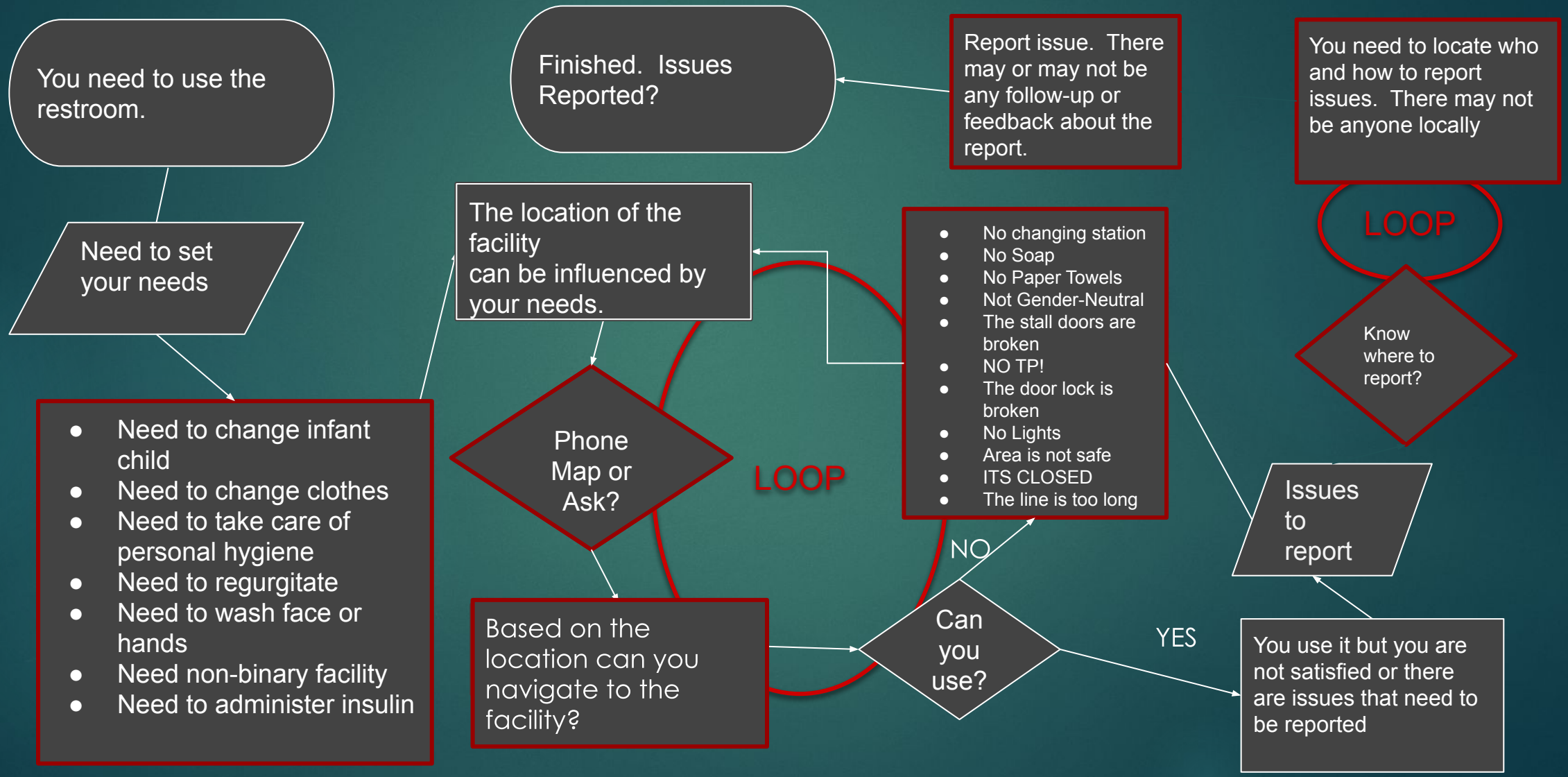
Problem Characteristics

- 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

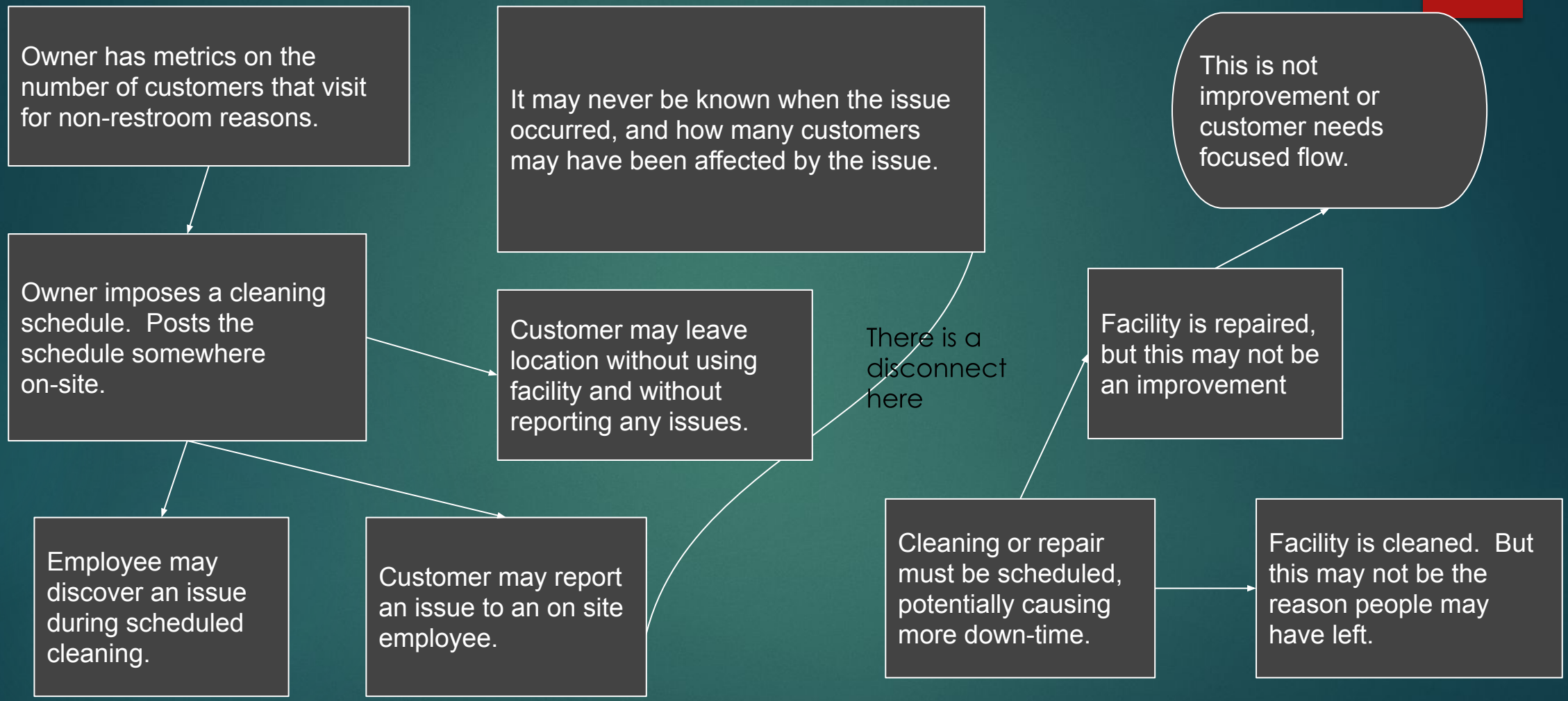
Ideal World


You need to use the restroom.
You locate the nearest facility.
You use the facility.
Finished. Nothing to report.

What actually happens for Users



What about the owner?



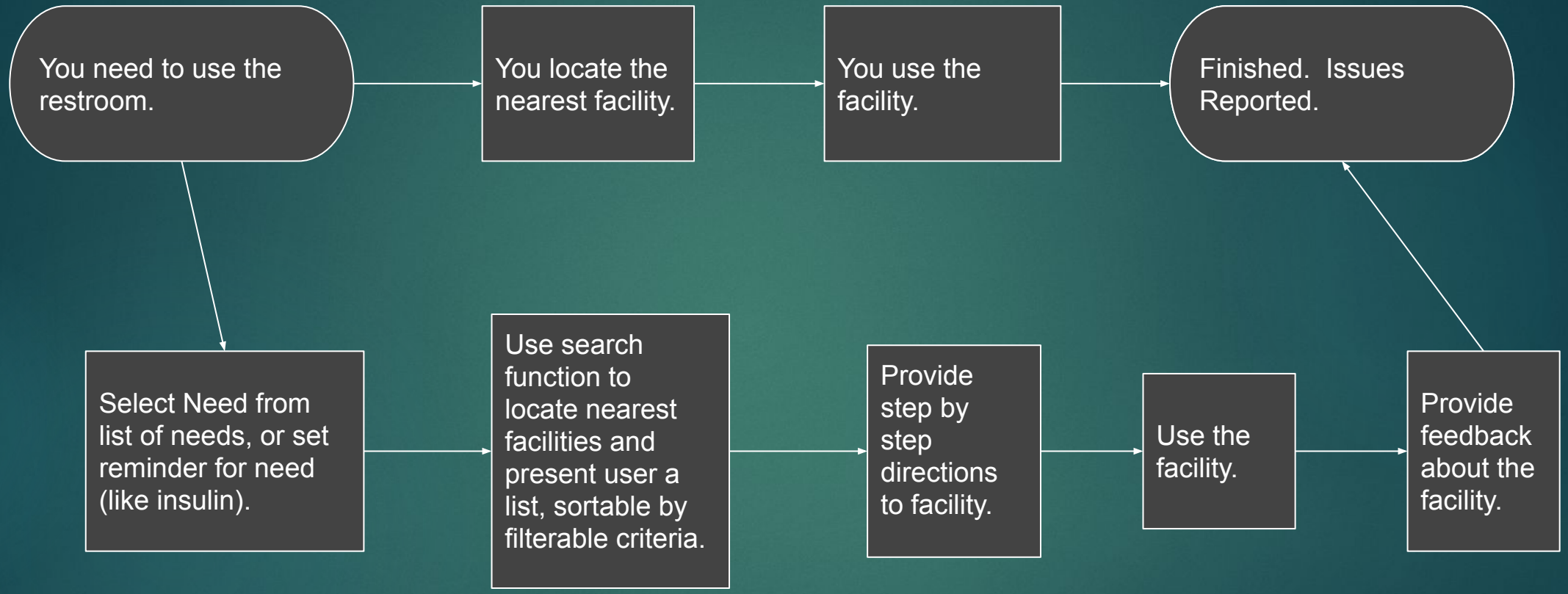
Solution Statement

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

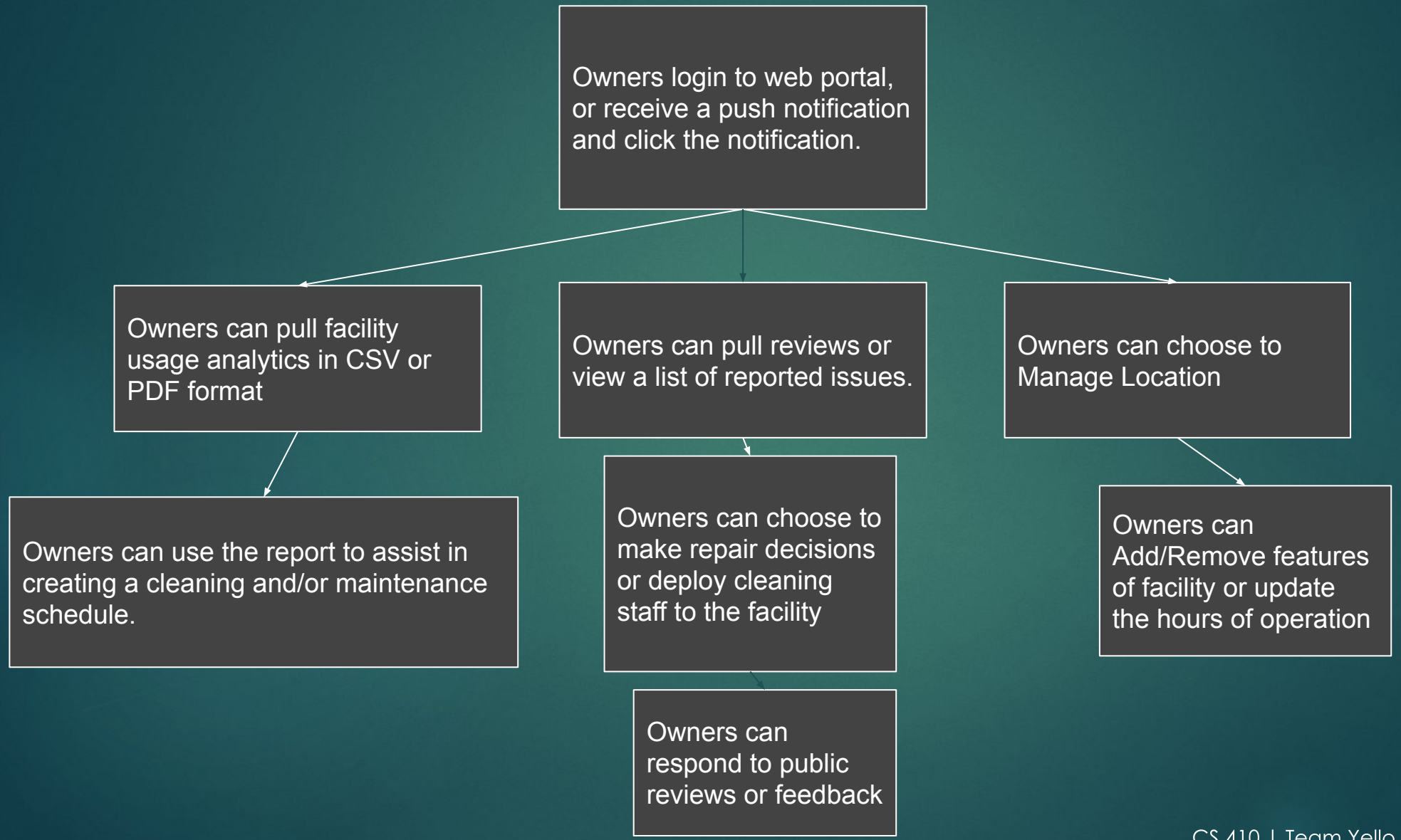
Solution Characteristics

- 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?



Owners can have better flow too...

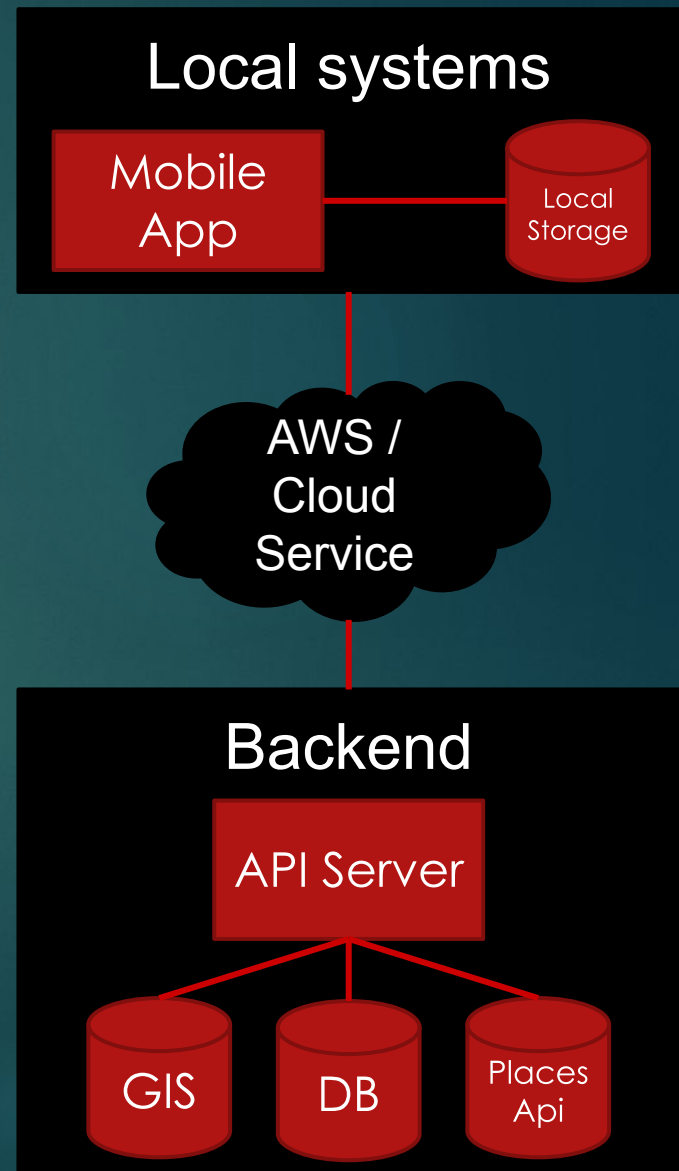


Our Duties

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

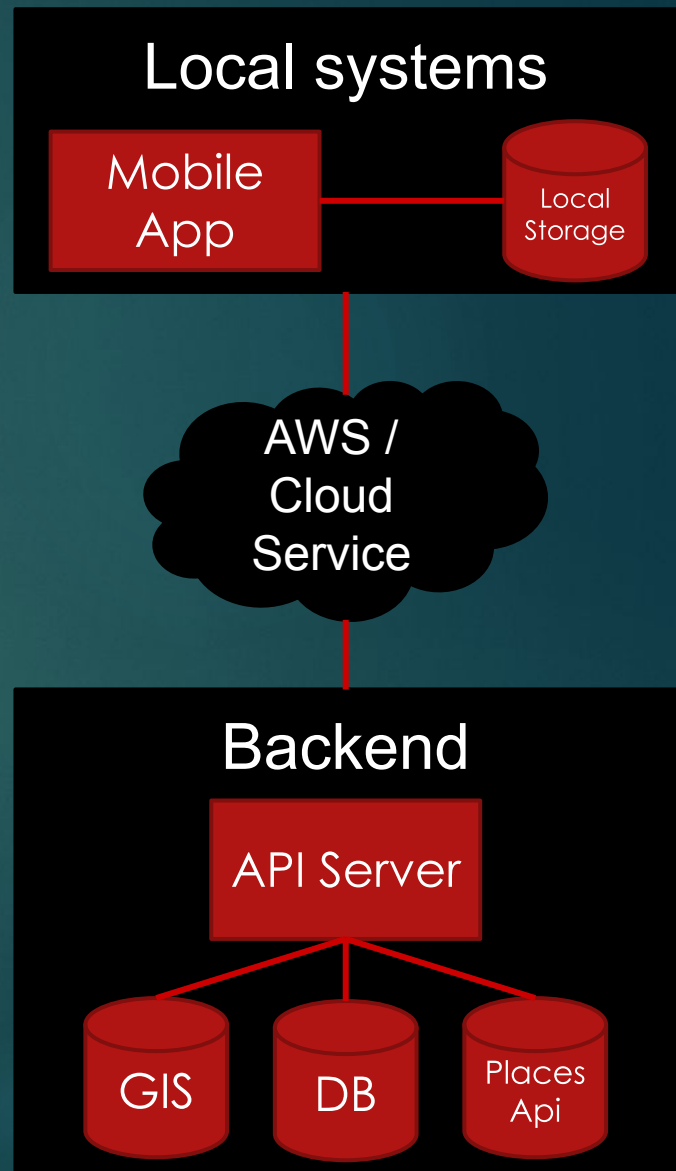
MFCD - Local Systems

- 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



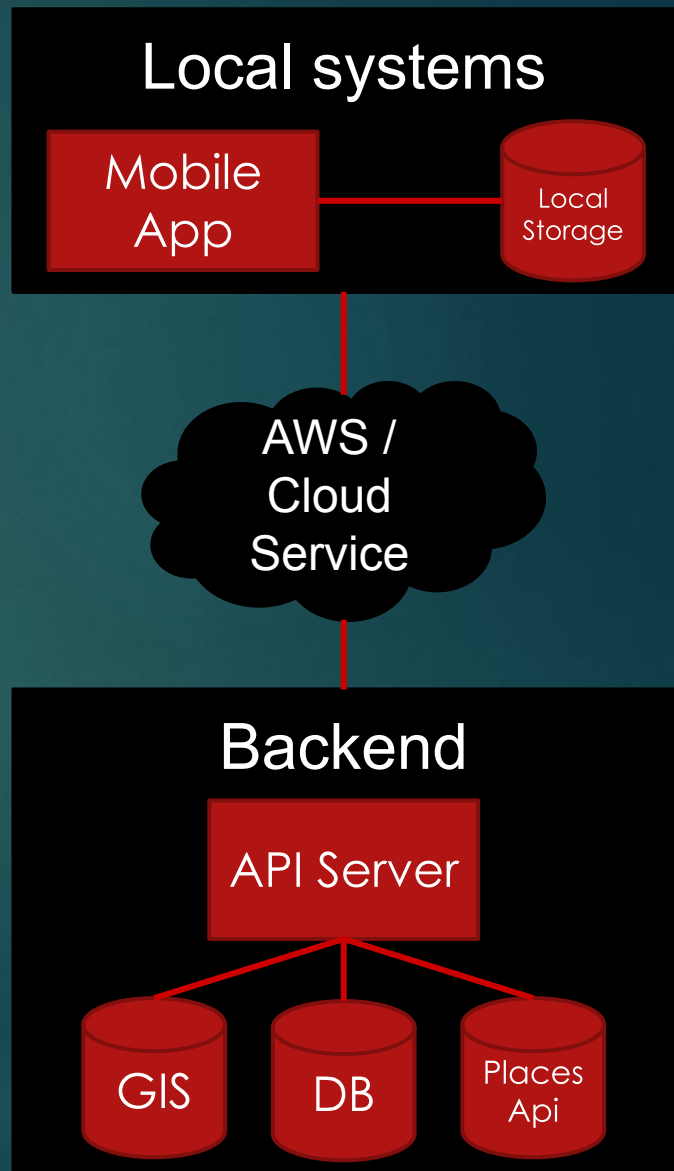
MFCD - Cloud

- 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



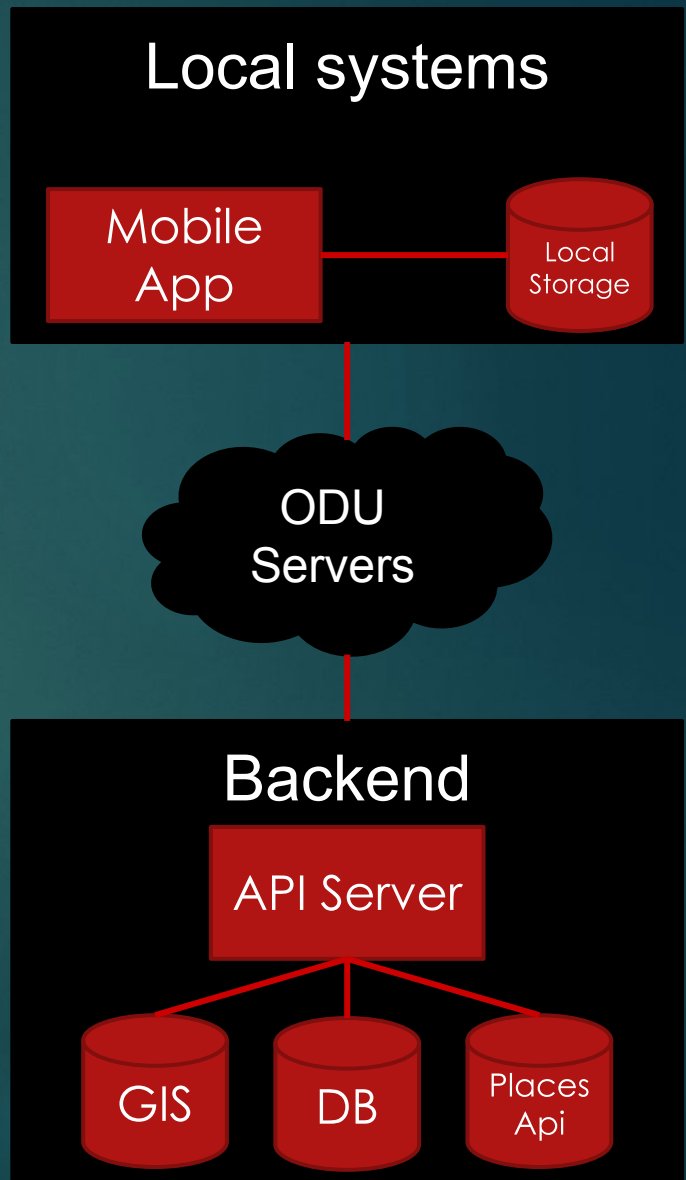
MFCD - Backend

- 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



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



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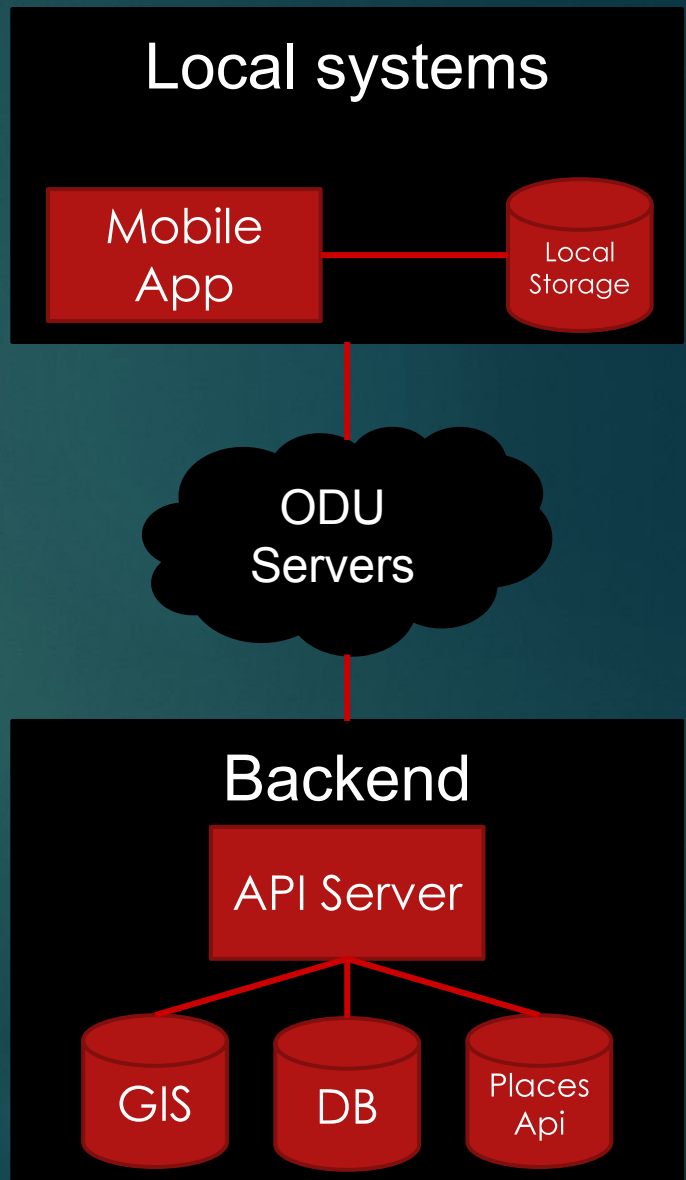
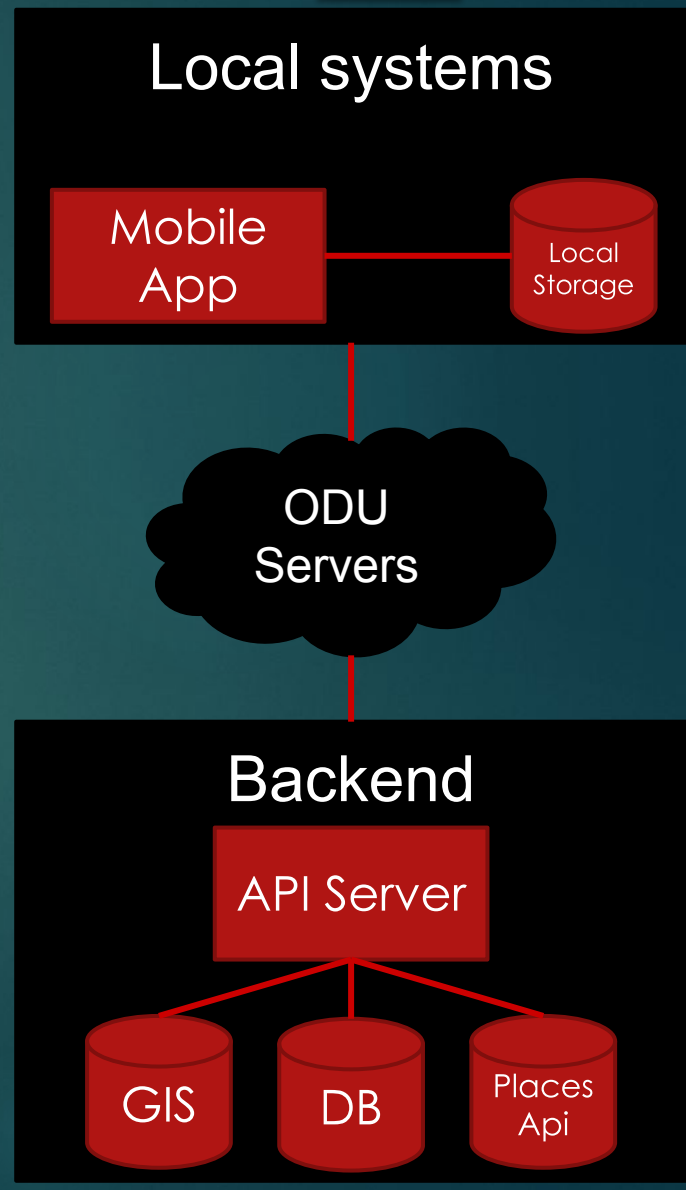


MFCD (Prototype) - ODU Servers

- 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



MFCD (Prototype) - Backend

- Using node.js and express.js will handle all the api calls
- Backend Db will be MongoDB
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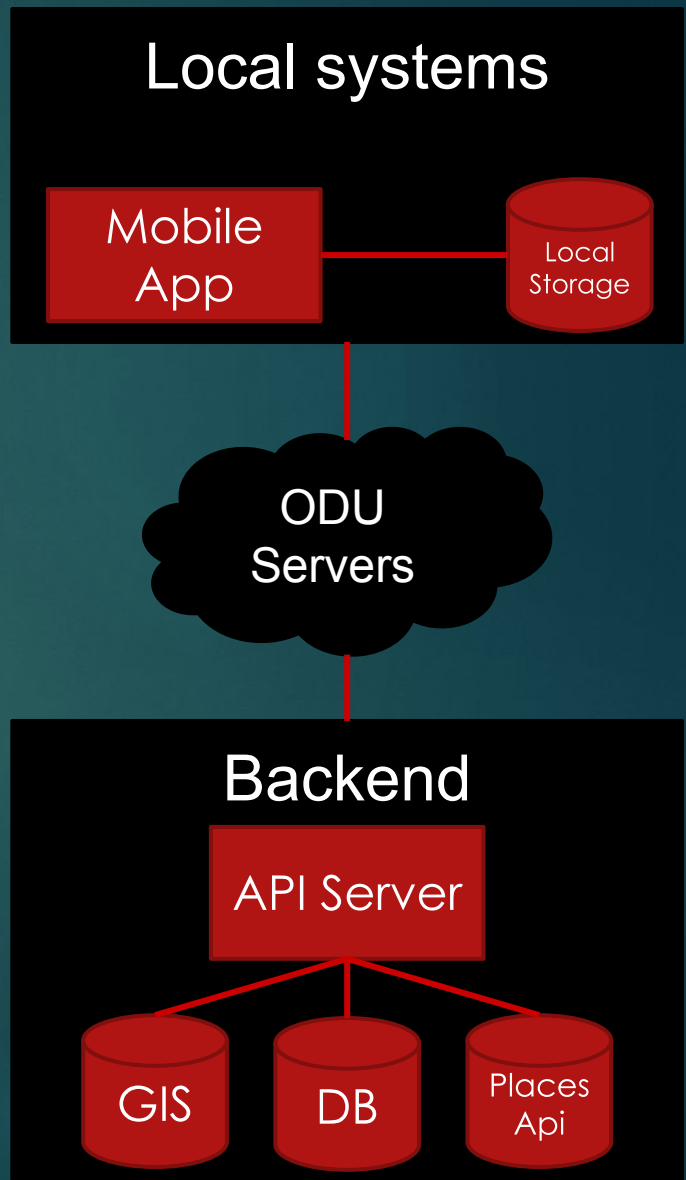


Competition Patron

	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 : JSdoc

Language : JavaScript

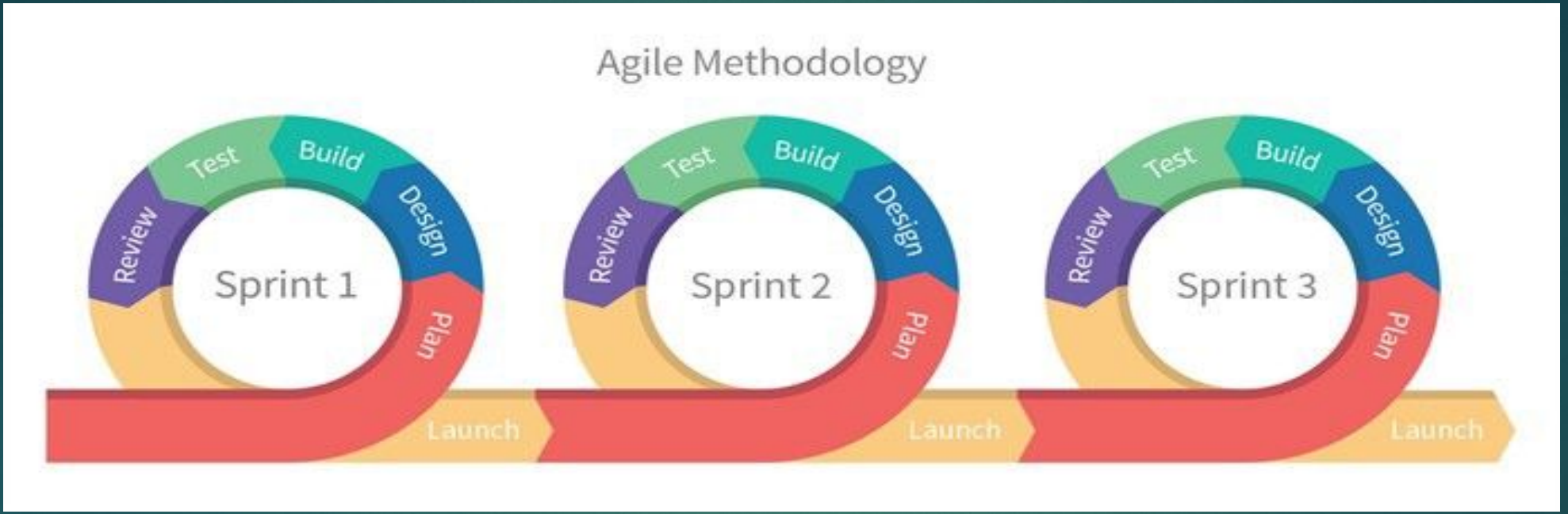
Library : Google's SDK

Framework : React native

WorkFlow : Agile

Database : DynamoDB

Development Model



Sprint 1:

- GUI
- User login/profile database
- Mapping and location database

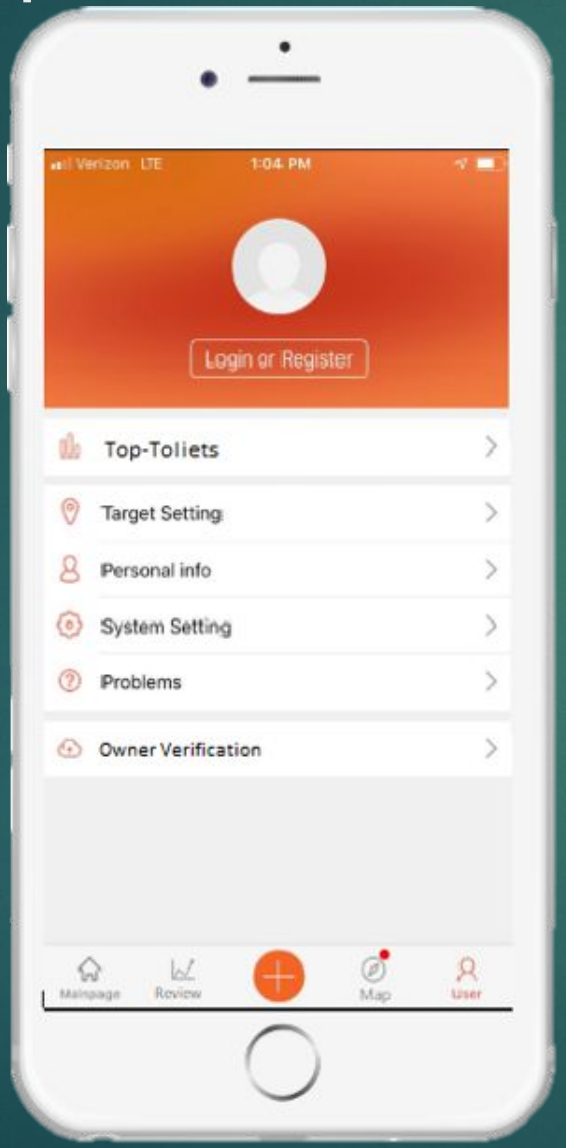
Sprint 2:

- Rating database
- Notification algorithm
- Verified and Unverified restroom

Sprint 3:

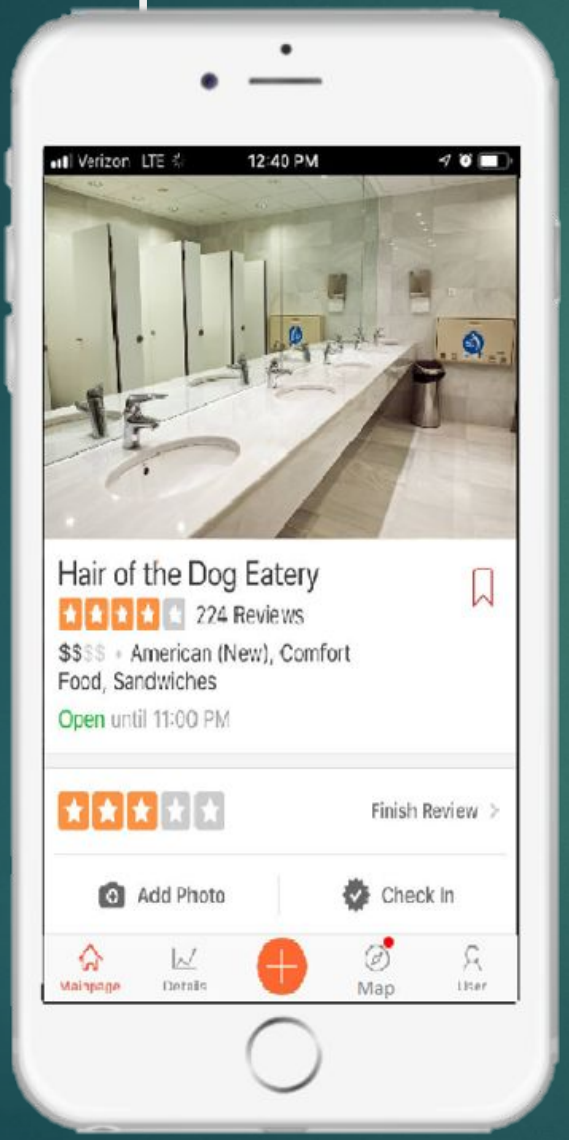
- Refine and optimize application
- Add additional features

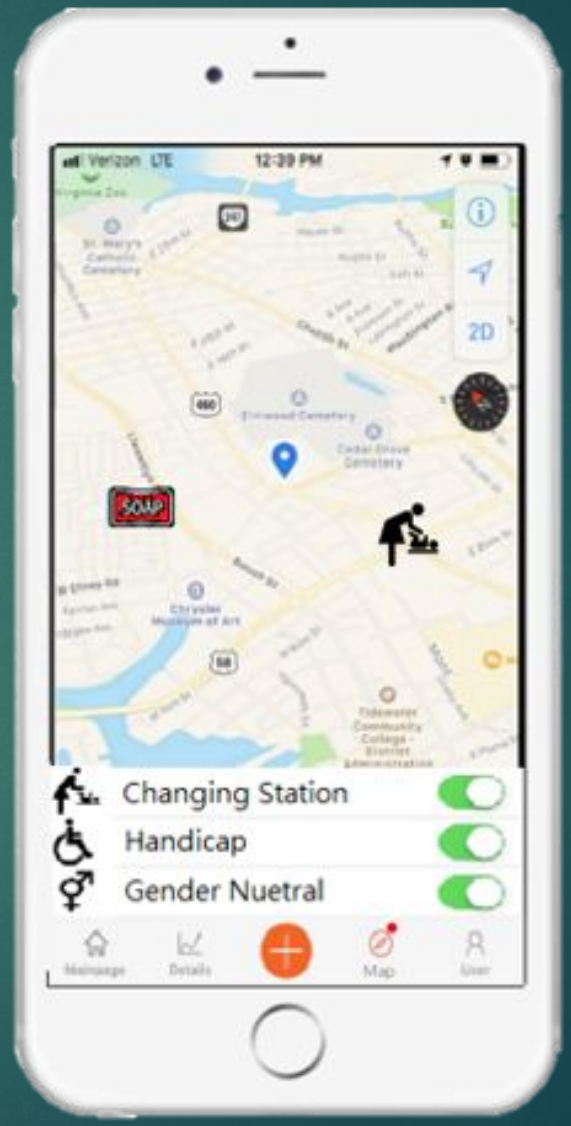
Mockups


Verizon LTE
1:04 PM
Login or Register
Top-Toliets
Target Setting
Personal info
System Setting
Problems
Owner Verification
Mainpage
Review
Map
User

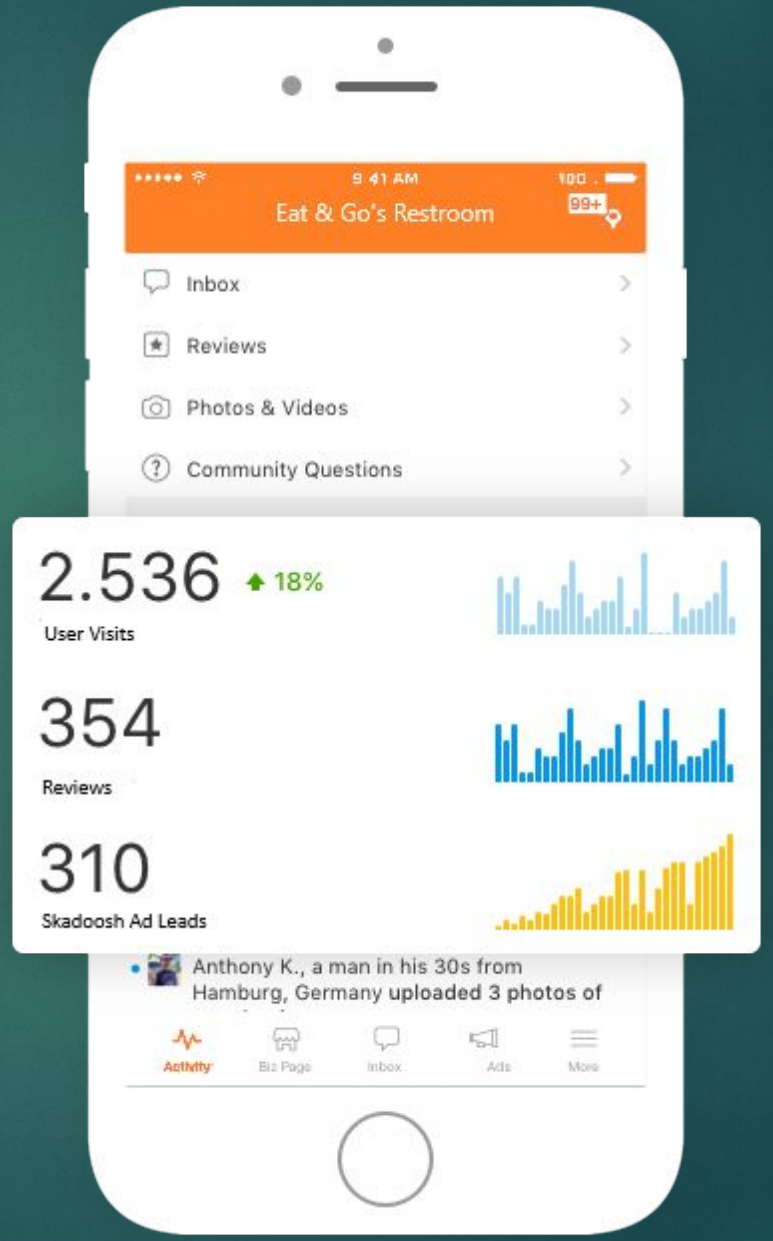

-103 AT&T
54%
2:20
Wednesday, January 25
Skadoosh
1m ago
Skadoosh Clogged
User has left a negative review
Tap to fix issue!

Mockups

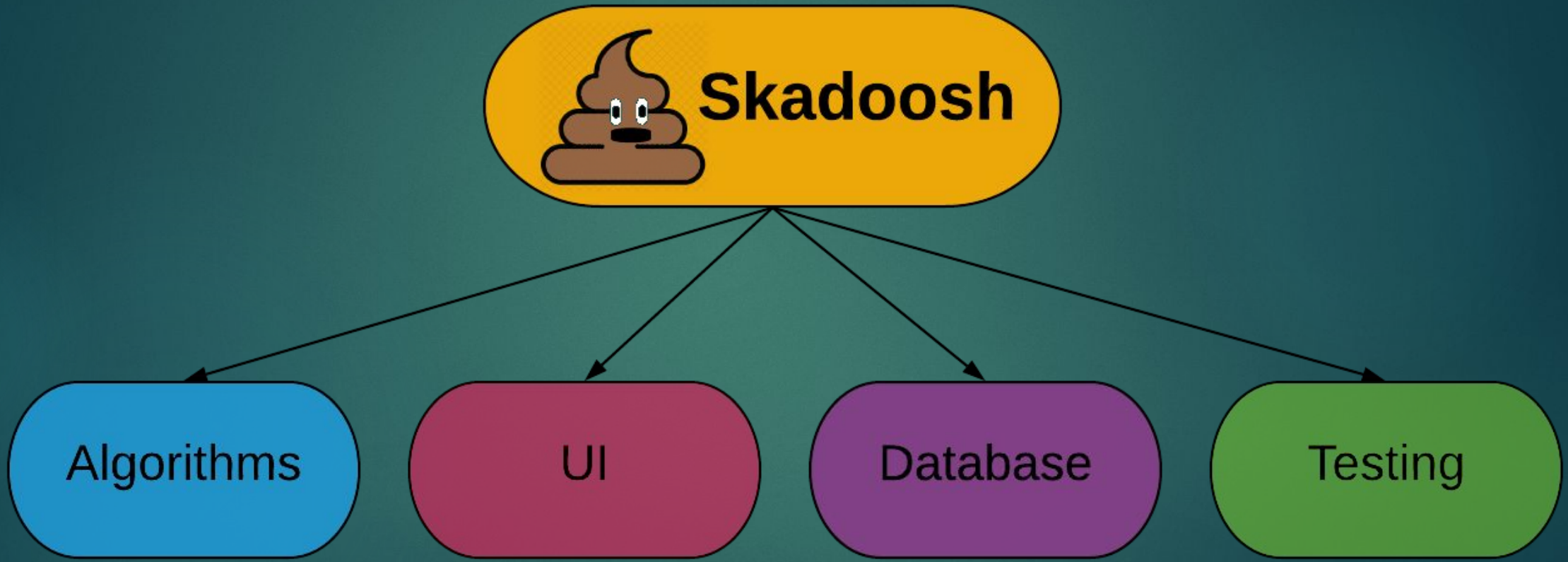

Verizon LTE 12:40 PM
Hair of the Dog Eatery
224 Reviews
$$$$ · American (New), Comfort Food, Sandwiches
Open until 11:00 PM
Finish Review
Add Photo
Check In
Map


Verizon LTE 12:39 PM
2D
SOAP
Changing Station
Handicap
Gender Nuetral
Map

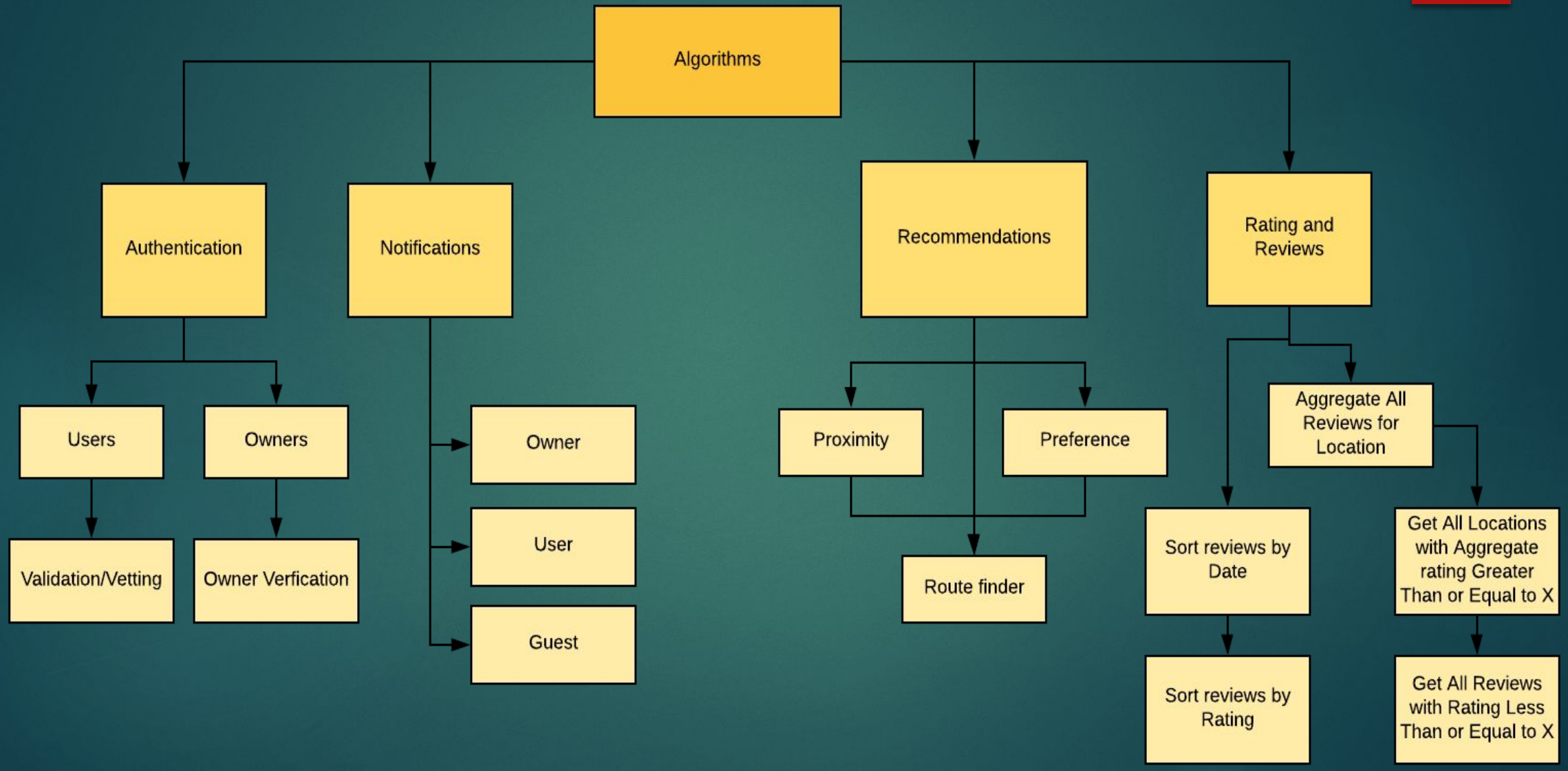
Owner Mockups



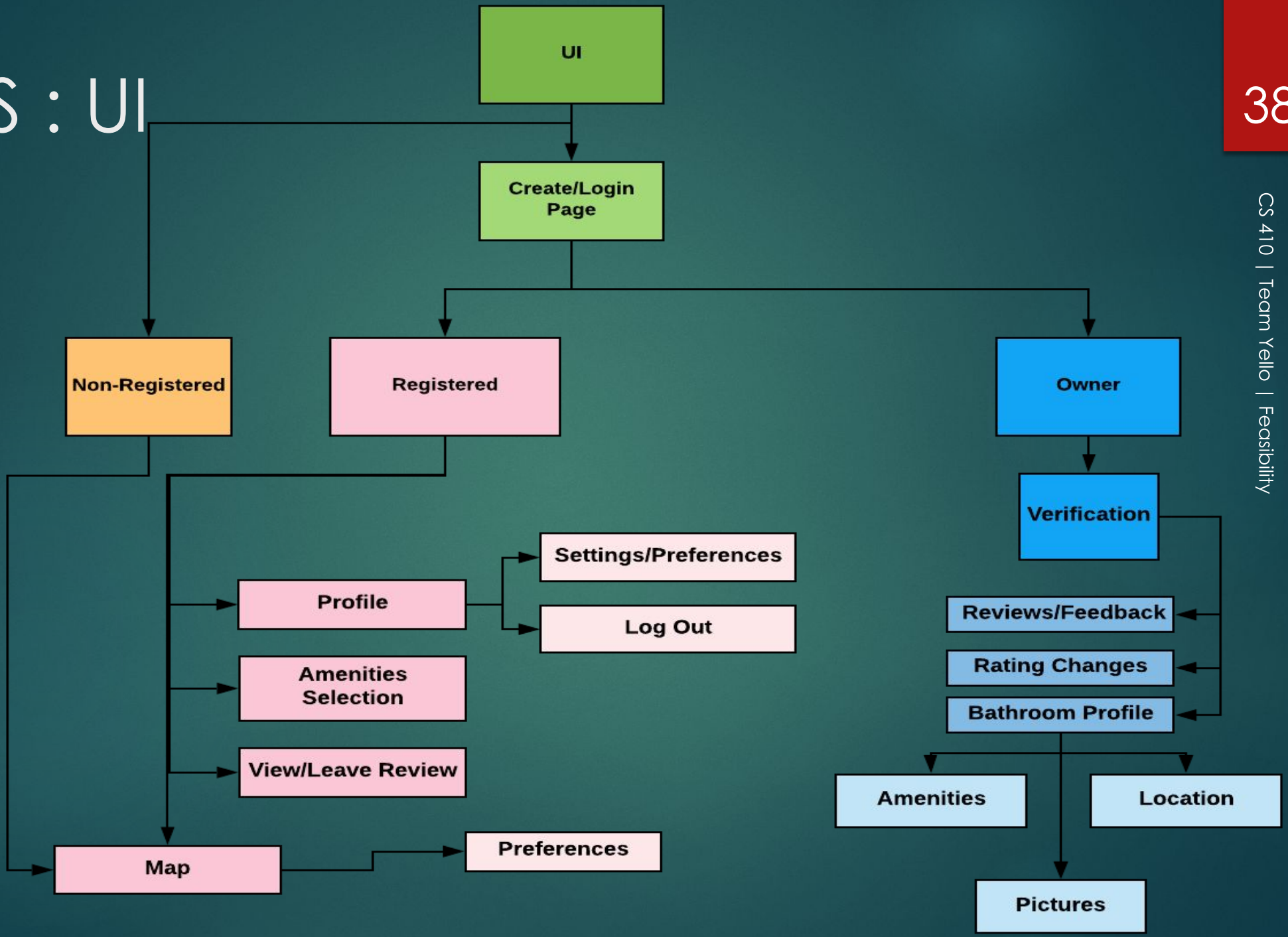
WBS



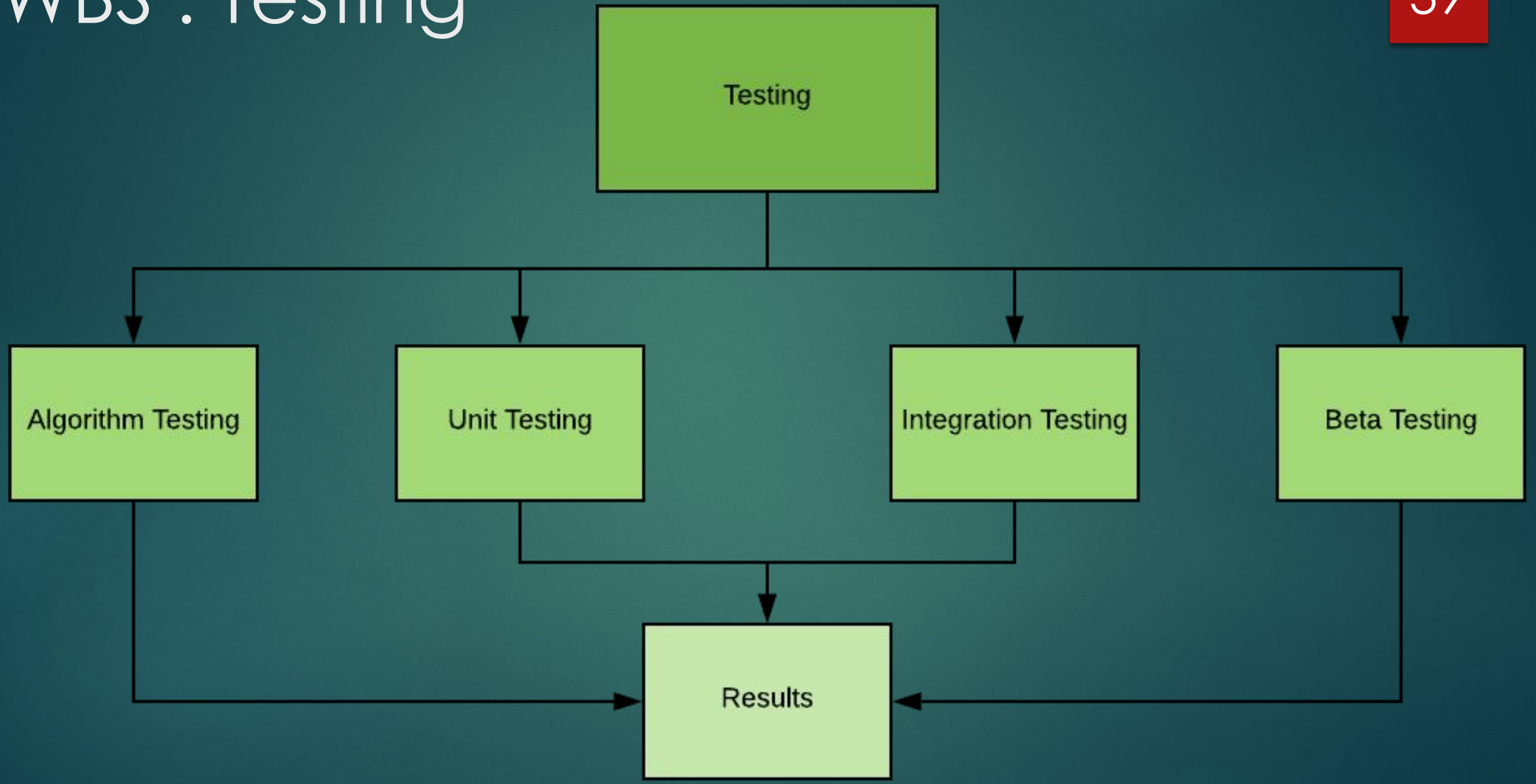
WBS: Algorithms



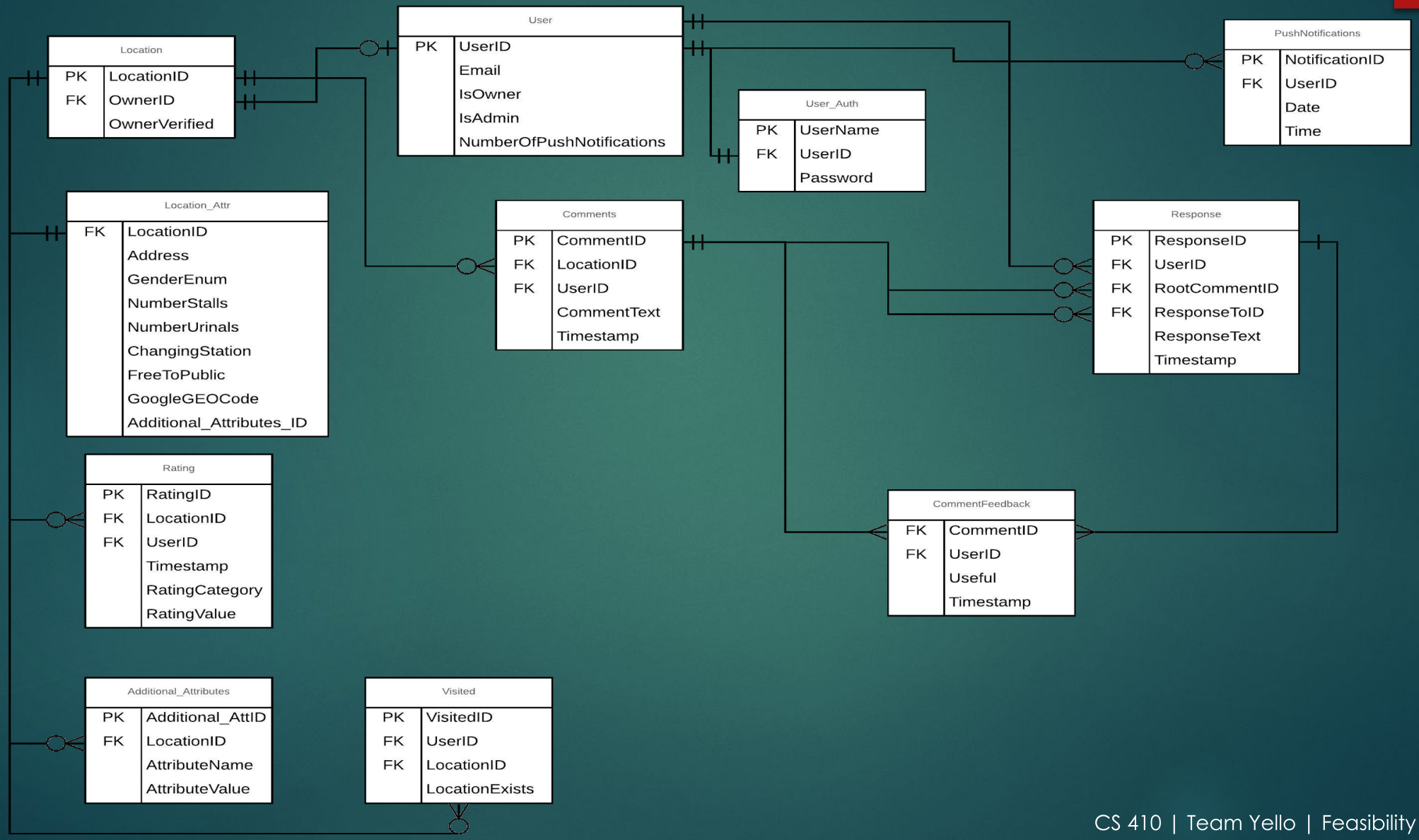
WBS : UI


UI
Create/Login Page
Non-Registered
Registered
Owner
Profile
Settings/Preferences
Log Out
Amenities Selection
View/Leave Review
Map
Preferences
Verification
Reviews/Feedback
Rating Changes
Bathroom Profile
Amenities
Location
Pictures

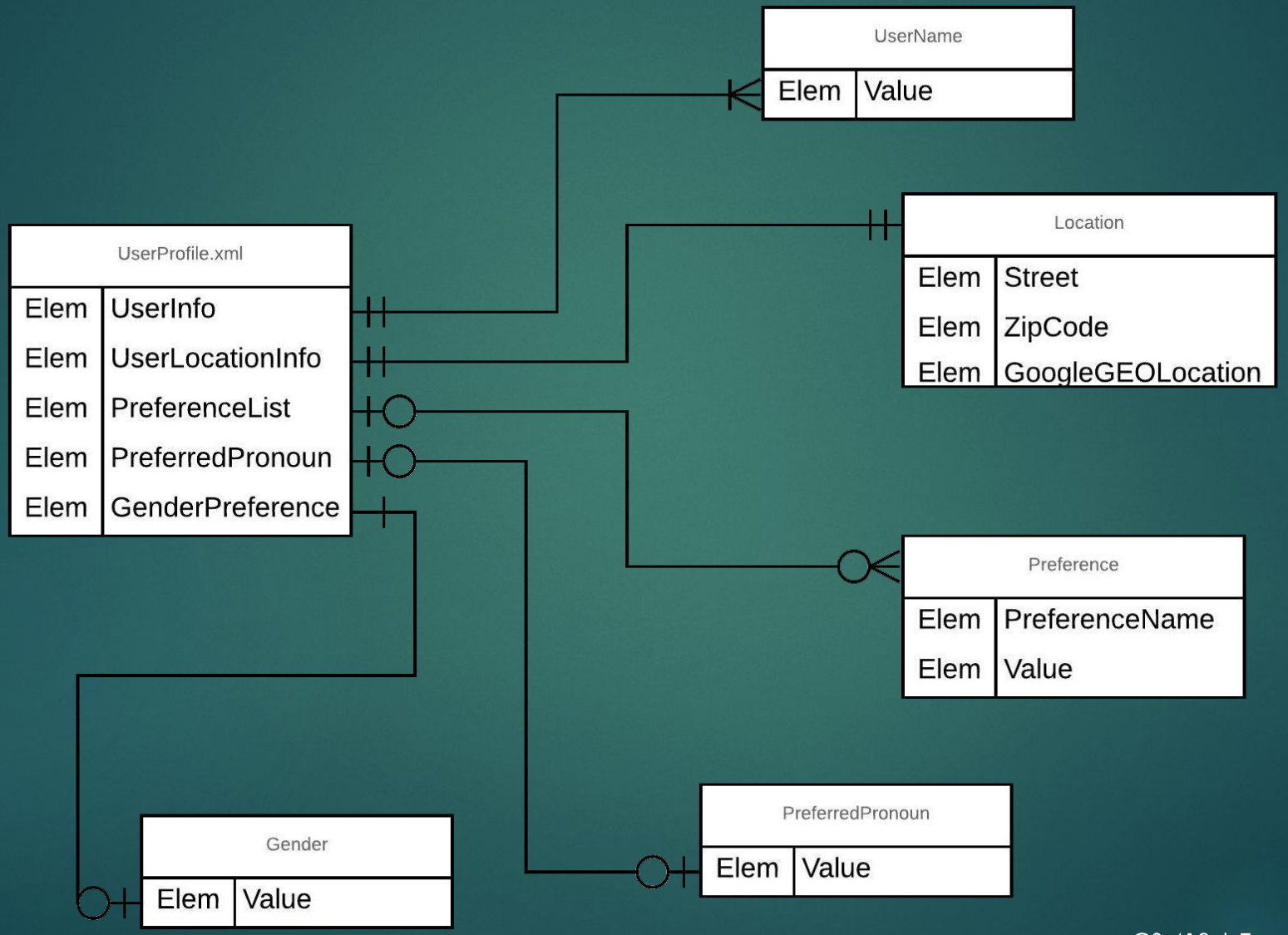
WBS : Testing


Testing
Algorithm Testing
Unit Testing
Integration Testing
Beta Testing
Results

WBS: Database (Cloud)



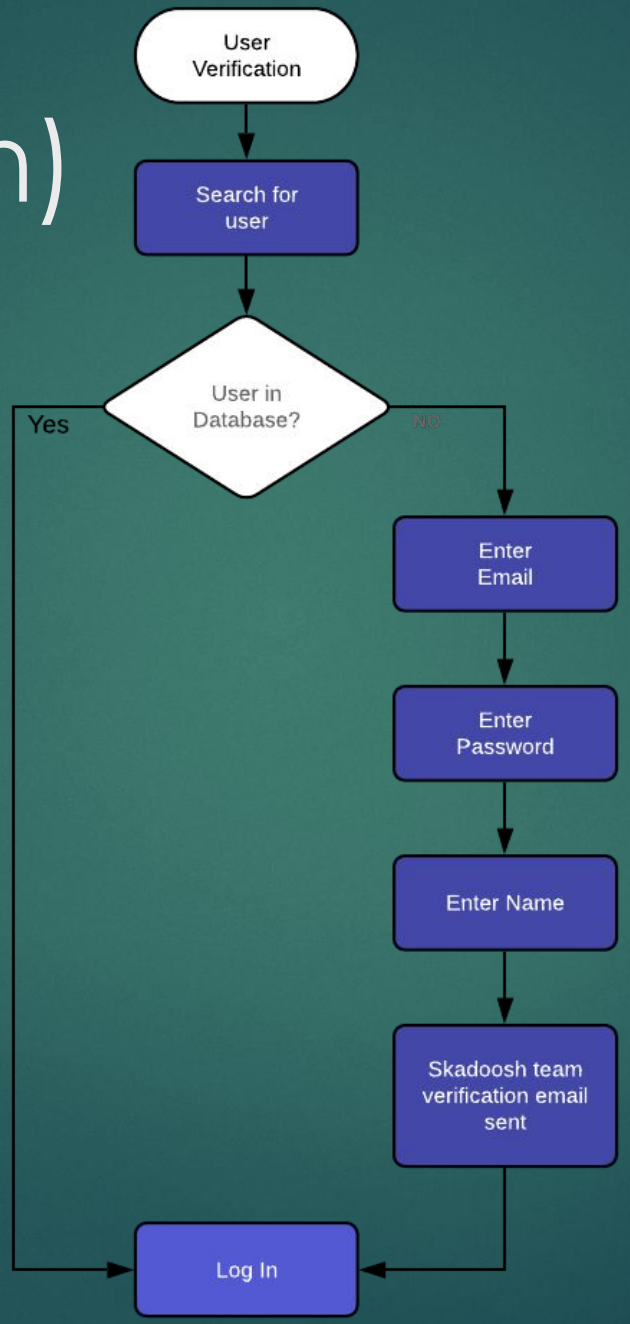
WBS: Database (Local XML)

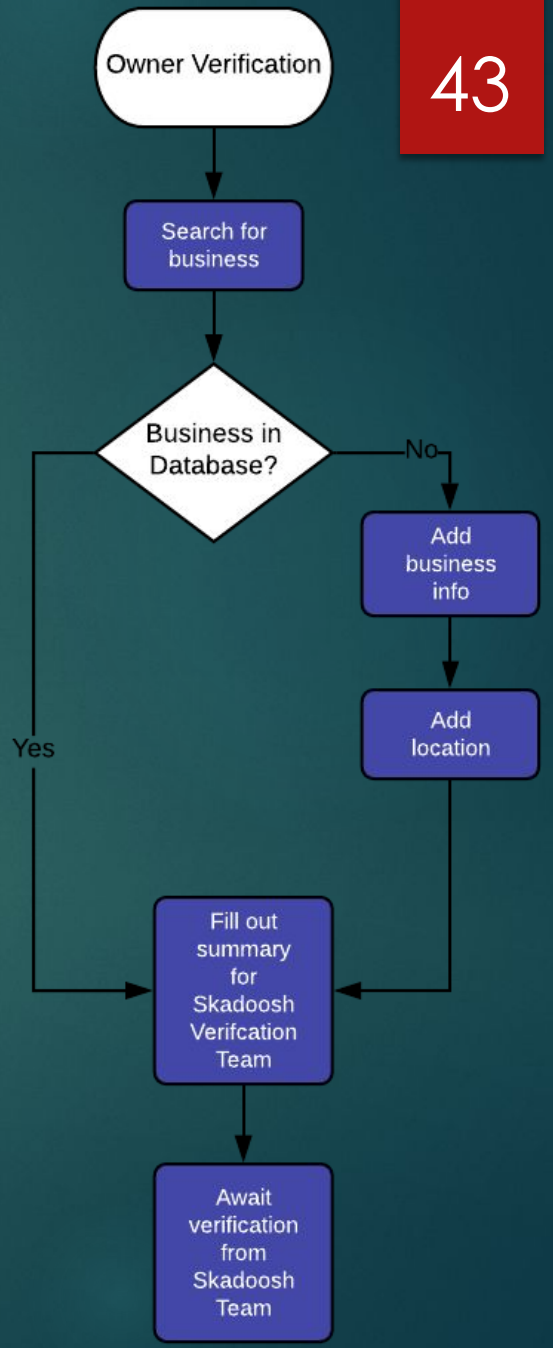


WBS: Database (Local XML)

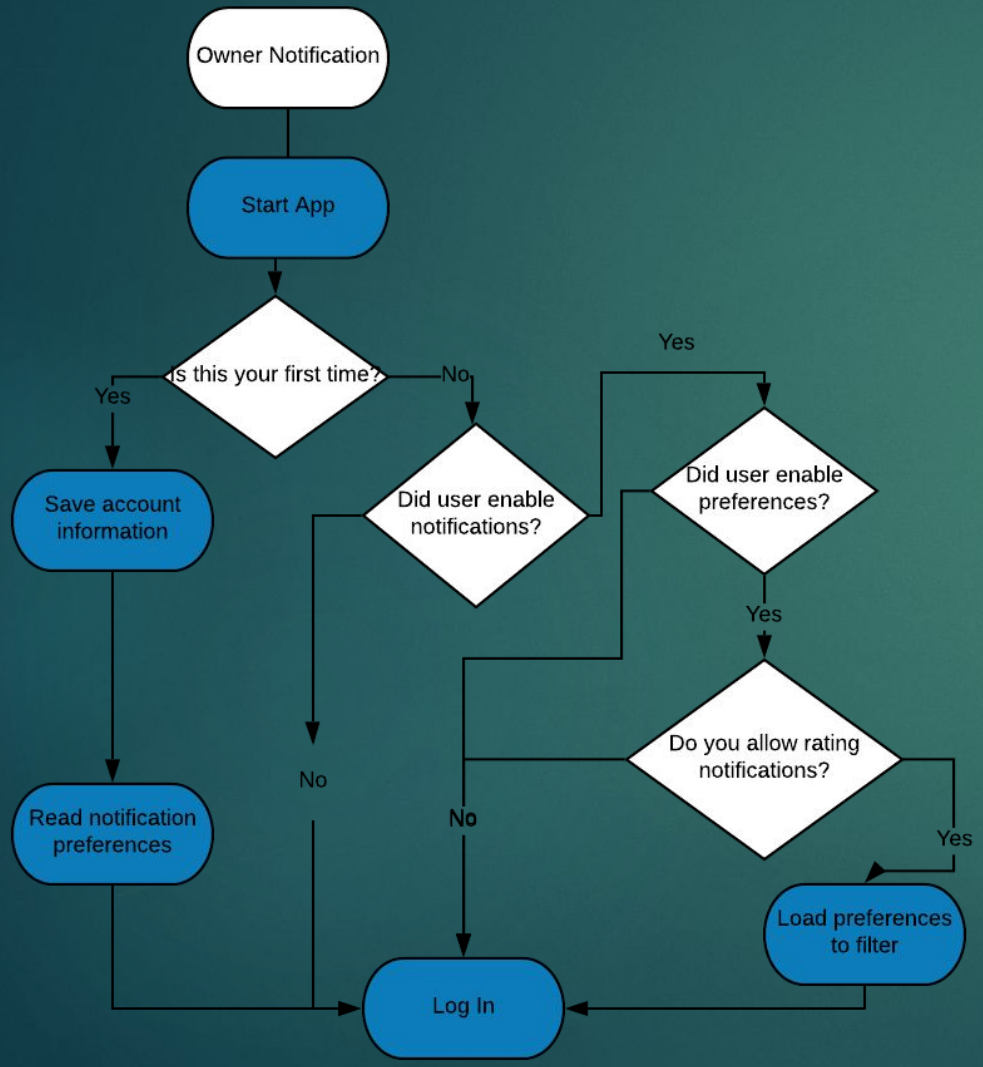

```
<SkadooshUserProfile>
    <!--One to several entries possible
        Store values for UserName, FirstName, LastName, etc
        Structure is extensible and customizable in the future-->
    <UserInfo>
        <InfoNode>
            <Name></Name>
            <Value></Value>
        </InfoNode>
        .
        .
        .
    </UserInfo>

    <!--Could be empty based on what user enters
        The GoogleGeoLocation with be the value that
        is populated when the application is turned on
        or when the user selects to update location-->
    <UserLocationInfo>
        <Street></Street>
        <Zip></Zip>
        <GoogleGeoLocation></GoogleGeoLocation>
    </UserLocationInfo>

    <!--One to several entries possible
        Structure is extensible and customizable in the future-->
    <PreferenceList>
        <Preference>
            <PreferenceName></PreferenceName>
            <Value></Value>
        </Preference>
        .
        .
        .
    </PreferenceList>

    <!--This will be how the application addresses the User-->
    <PronounPreference>
        <Value></Value>
    </PronounPreference>

    <!--Bathroom Gender Preference-->
    <GenderPreference>
        <Value></Value>
    </GenderPreference>

</SkadooshUserProfile>
```

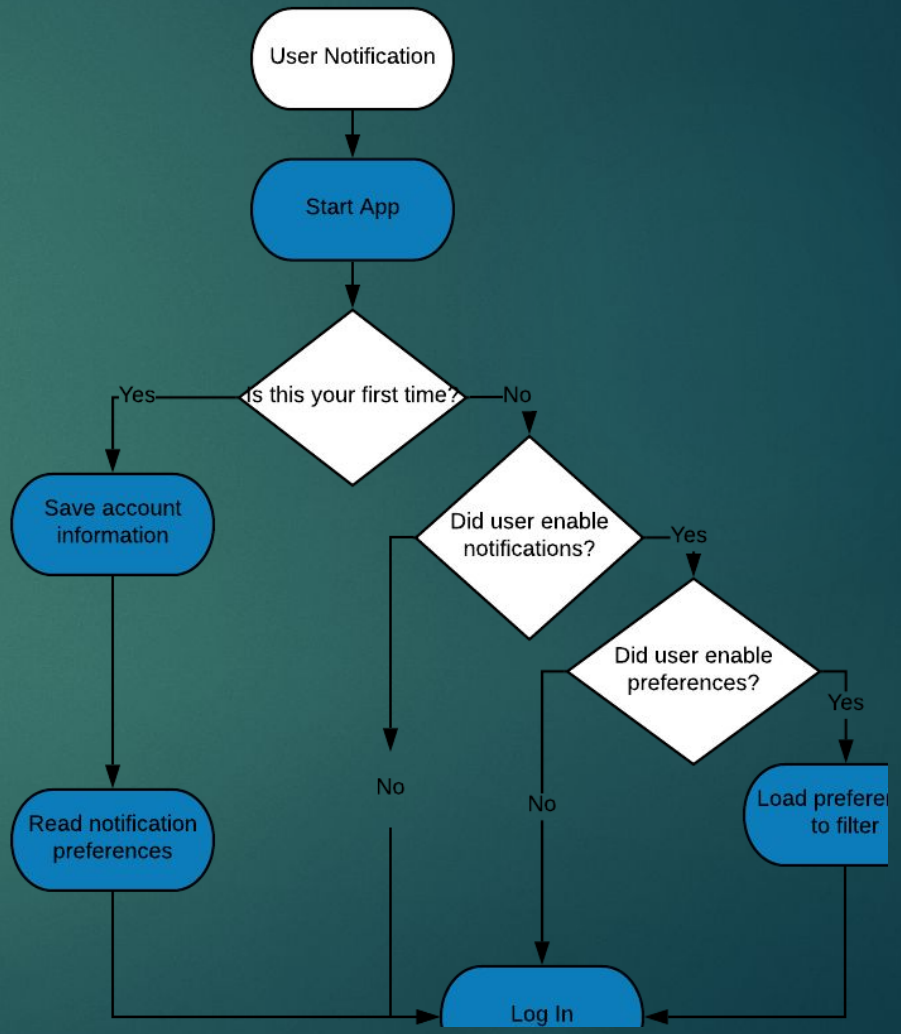
Logic Flows (Authentication)



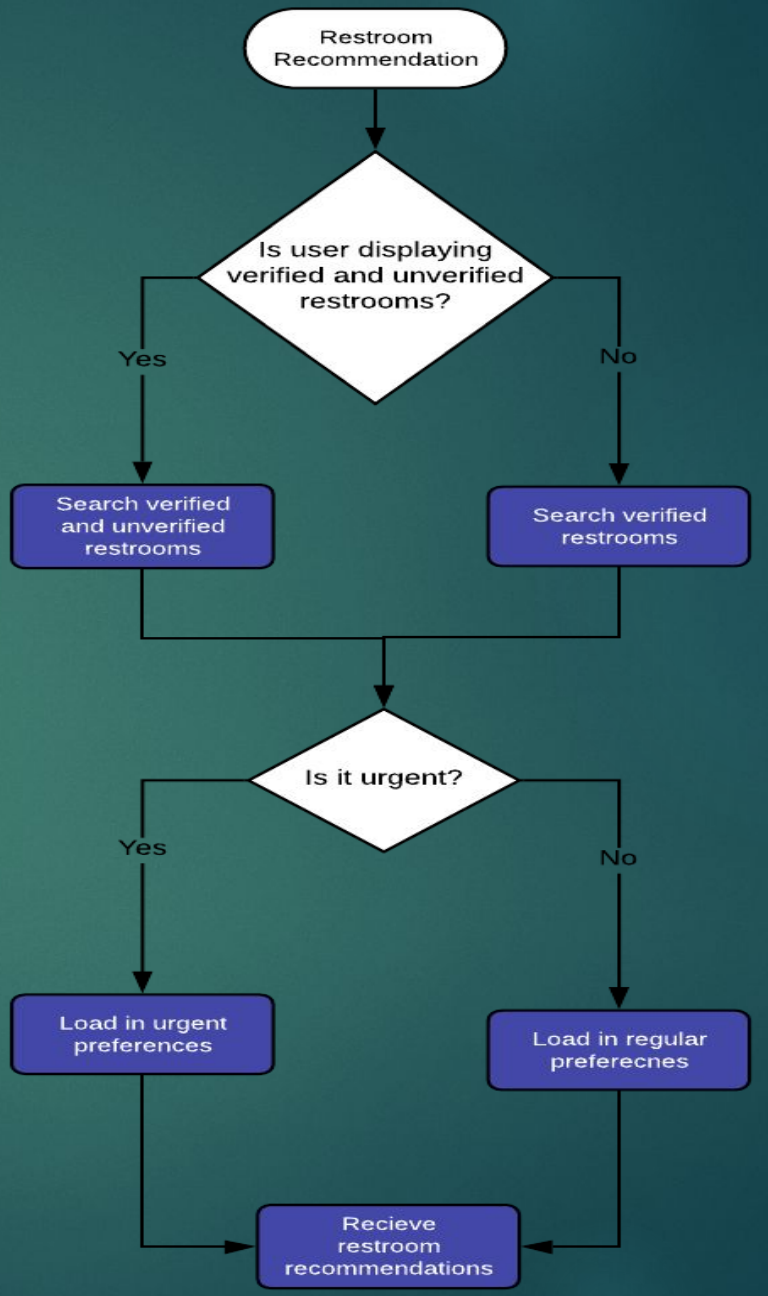


Logic Flows (Notification)

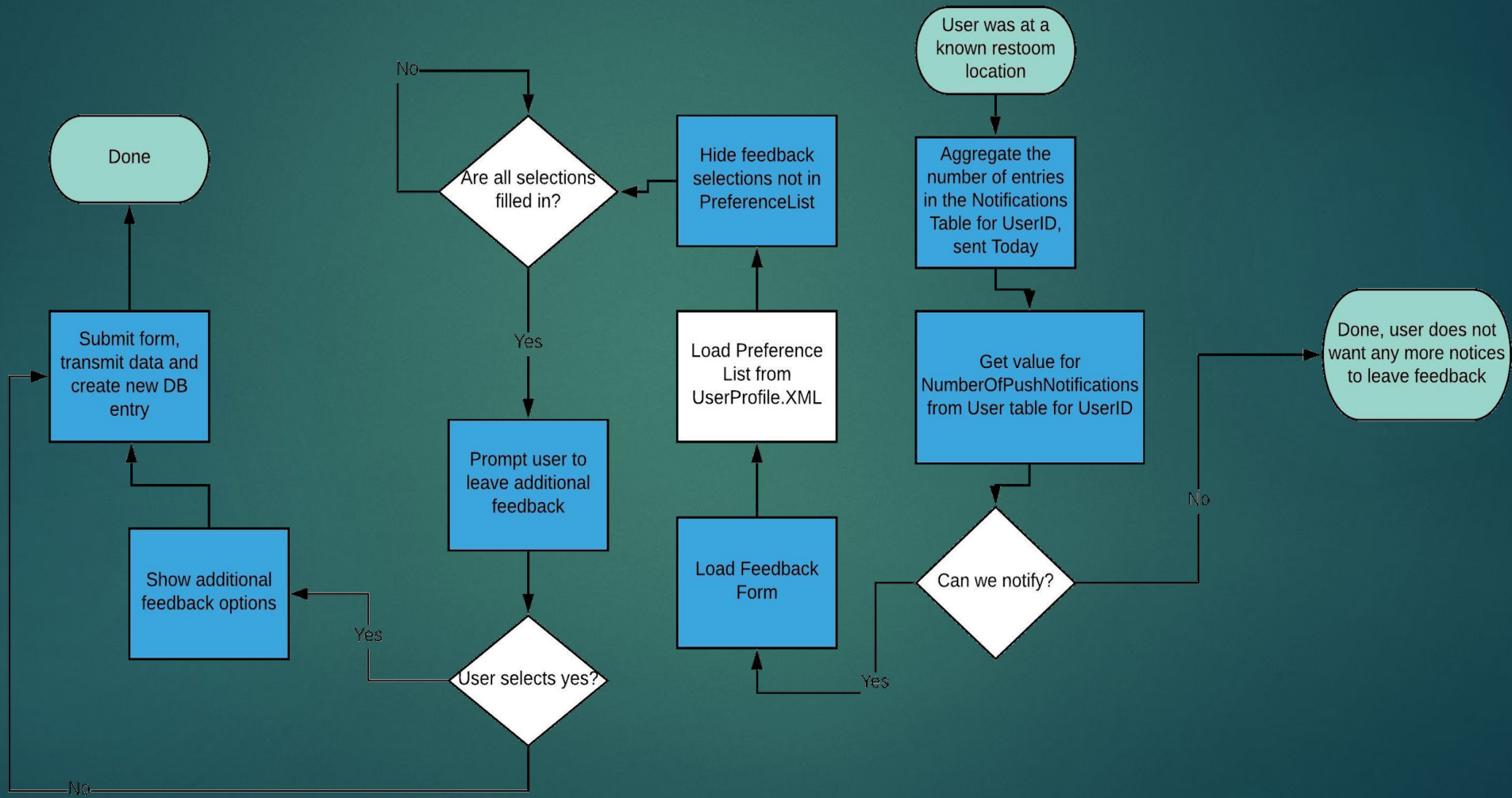




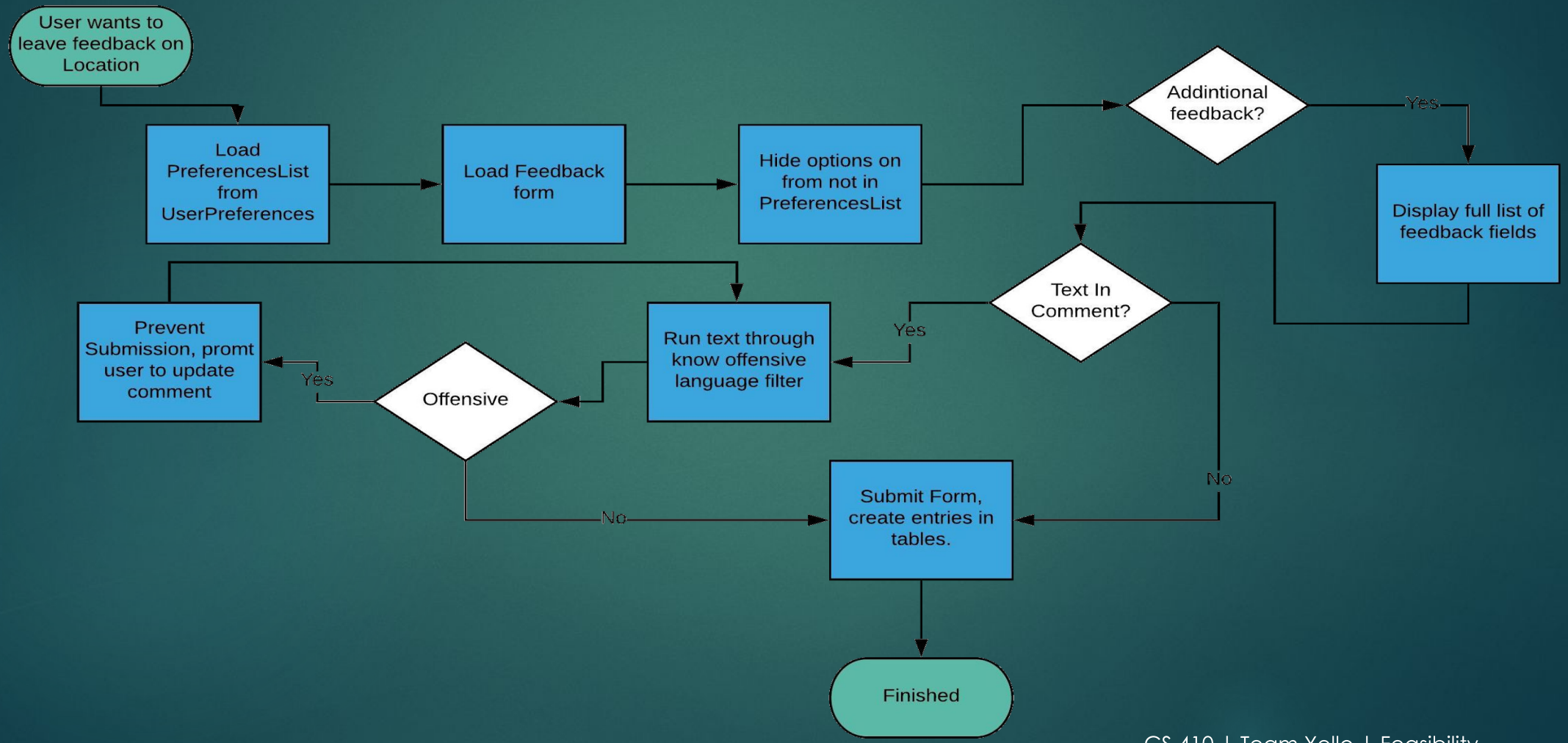
Logic Flows (Recommendations)



Logic Flows (Rating)



Logic Flows (Feedback)



Risk Matrix

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

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: Owner misrepresentation
C-4: Excessive notifications could cause users to become agitated

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

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

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

Legend

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

Customer Risk C-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

User misuse

- 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

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

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

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

Risk

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

Mitigation

We will implement our notification algorithm

Legend

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

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

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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