

# S2a -Conceptual Design Documents

## **Washu**

A mobile application by  
**TaxiPack Corp.**

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## **Users**

Washu consists of the following classes of users:

### **Car Owners:**

Car owners are the primary customers of Washu. They interact with the Washu mobile application to get Washu car wash regions, order car washes, set their user profile, mark their car on a map, upload images, and leave customer satisfaction reviews.

### **Car Washers:**

Car washers are employed by the business managers that license the Washu application. Their user profiles are set up by the business manager. Car washers use the Washu application to get notified of ordered car washes, see a map and list of Washu regions and car wash orders, mark completed car washes, upload wash complete images, see their wash service ratings and leave ratings for their customers.

### **Business Manager:**

Managers handle the administrative aspects of the server. Managers use the Washu application to set and manage car wash regions, set up car washer profiles including image uploading and see car owner and car washer reviews.

# Use Case Diagrams

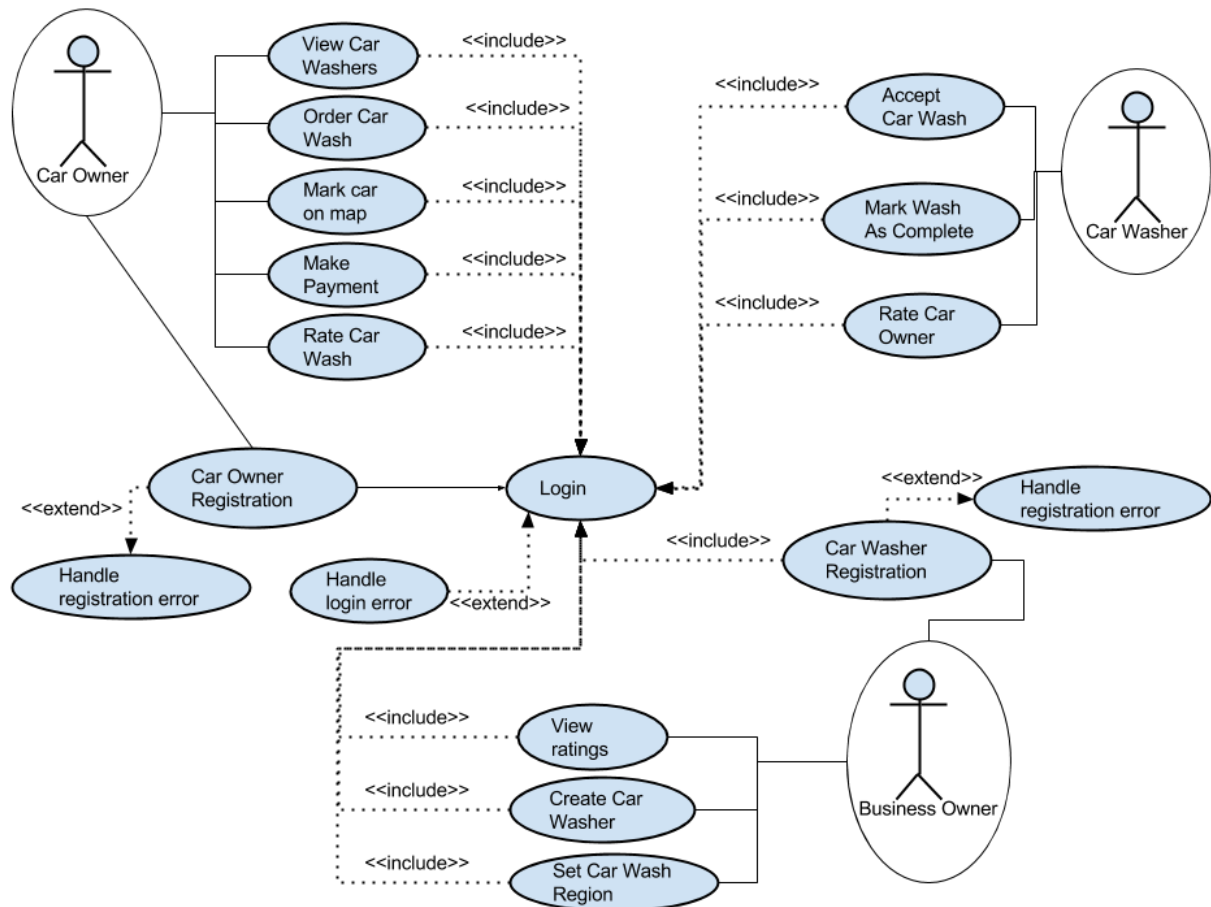


Figure 1. Use case diagram for Washu system.

## Use Cases

<b>ID</b>	1
<b>Description</b>	Car owner sets up user profile
<b>Actors</b>	Car owner
<b>Preconditions</b>	Car Owner has downloaded Washu application and has notifications allowed on their mobile device
<b>Basic Steps</b>	<ul style="list-style-type: none"><li>• Car owner opens up the Washu app</li><li>• Car owner enters personal information to set up a profile</li></ul>
<b>Exceptions</b>	Invalid form input eg. no “@” for email address, invalid number of digits for phone number
<b>Business validations/Rules</b>	User profile cannot contain profanity
<b>Postconditions</b>	Car Owner profile is set up with Washu

<b>ID</b>	2
<b>Description</b>	Car owner receives notification of entering Washu car wash region
<b>Actors</b>	Car owner
<b>Preconditions</b>	Car Owner has downloaded Washu application and has notifications allowed on their mobile device
<b>Basic Steps</b>	<ul style="list-style-type: none"><li>• Car Owner enters Washu car wash region</li><li>• Washu application pushes notifies to car owner’s mobile device</li><li>• Car Owner accepts or declines car wash</li></ul>
<b>Exceptions</b>	N/A

<b>Business validations/Rules</b>	N/A
<b>Postconditions</b>	Notification is removed after user decision to accept or decline wash

<b>ID</b>	3
<b>Description</b>	Car owner orders car wash
<b>Actors</b>	Car owner
<b>Preconditions</b>	Car Owner has logged into Washu application Payment information completed and verified Car Owner in Wash car wash region
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• Car Owner selects wash package</li> <li>• Car Owner verifies package ordered and price</li> </ul>
<b>Exceptions</b>	N/A
<b>Business validations/Rules</b>	Only available services and washers are displayed
<b>Postconditions</b>	Car owner is informed car wash order has been placed

<b>ID</b>	4
<b>Description</b>	Car owner uploads image of vehicle
<b>Actors</b>	Car owner
<b>Preconditions</b>	Car Owner has logged into Washu application
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• Car owner takes a picture of their car using the Washu camera feature</li> <li>• Car owner uploads the picture to the Washu</li> </ul>
<b>Exceptions</b>	N/A
<b>Business</b>	Only the device's still image capture feature is used ie. device's

<b>validations/Rules</b>	video option is not accessible through Washu
<b>Postconditions</b>	Image uploaded and associated with car owner/wash order

<b>ID</b>	5
<b>Description</b>	Car owner makes payment
<b>Actors</b>	Car owner
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>Car Owner has logged into Washu application and has payment information included in their profile.</li> <li>User has started car wash order</li> </ul>
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>Washu app automatically charges the user's credit card</li> </ul>
<b>Exceptions</b>	No credit card info, ask user to input their payment information
<b>Business validations/Rules</b>	N/A
<b>Postconditions</b>	Car owner is notified that payment is complete

<b>ID</b>	6
<b>Description</b>	Car owner marks their car on a map
<b>Actors</b>	Car owner
<b>Preconditions</b>	<p>Car owner is logged into the Washu app and has uploaded an image of their vehicle</p> <p>Car owner has started car wash order</p>
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>User taps on Mark Vehicle On Map</li> <li>User sees view of wash region and taps on location of their car</li> </ul>
<b>Exceptions</b>	User cannot tap outside of car wash region (invalid region)
<b>Business validations/Rules</b>	User can only make one mark of their car on the map.

<b>es</b>	
<b>Postconditions</b>	The car wash order contains mark of car owner's vehicle location on wash region map.

<b>ID</b>	7
<b>Description</b>	Car owner leaves review for car washer
<b>Actors</b>	Car owner
<b>Preconditions</b>	Car Owner has logged into Washu application and wash is marked completed by Car Washer
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• User opens completed wash</li> <li>• User taps on Leave Washer Review</li> <li>• User chooses rating and (optionally) enters in comment</li> <li>• User taps on Submit Review</li> </ul>
<b>Exceptions</b>	No review rating is chosen(required)
<b>Business validations/Rules</b>	Review comment cannot contain profanity
<b>Postconditions</b>	A car washer review is associated with its respective wash order.

<b>ID</b>	8
<b>Description</b>	Car washer accepts notification of car order
<b>Actors</b>	Car washer
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• Car Washer has downloaded Washu application and has notifications allowed on their mobile device.</li> <li>• Business manager has set up their user profile.</li> <li>• Car Washer is logged in</li> </ul>
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• A notification is pushed to the user's mobile device</li> <li>• User taps on Accept to accept the car wash order</li> </ul>
<b>Exceptions</b>	N/A

<b>Business validations/Rules</b>	N/A
<b>Postconditions</b>	The car wash is marked as in progress.

<b>ID</b>	9
<b>Description</b>	Car washer marks wash as complete
<b>Actors</b>	Car washer
<b>Preconditions</b>	Car Washer is logged in
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• User opens car wash that is in progress</li> <li>• User taps on Mark Wash As Complete</li> </ul>
<b>Exceptions</b>	N/A
<b>Business validations/Rules</b>	N/A
<b>Postconditions</b>	The carwash in progress is marked as complete. The car owner receives a notification stating so.

<b>ID</b>	10
<b>Description</b>	Car washer uploads image
<b>Actors</b>	Car washer
<b>Preconditions</b>	Car Washer is logged in, Car washer has completed a wash
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• User taps on Upload Image</li> <li>• Device's camera application is opened to take a photo</li> <li>• Picture is shown for review and confirmation</li> <li>• User taps on Retake to take another image</li> <li>• User taps on Upload to finalize image choice</li> </ul>
<b>Exceptions</b>	N/A



<b>Business validations/Rules</b>	Device's camera functionality is restricted to image stills only
<b>Postconditions</b>	An image is associated with the car washer's wash

<b>ID</b>	11
<b>Description</b>	Car washer leaves review for customer
<b>Actors</b>	Car washer
<b>Preconditions</b>	Car Washer is logged in
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• User taps on completed car wash</li> <li>• User taps on Leave Customer Review</li> <li>• User enters in rating and comment in review form</li> </ul>
<b>Exceptions</b>	Invalid review when no star rating is entered
<b>Business validations/Rules</b>	Review comment cannot include profanity
<b>Postconditions</b>	A customer review is associated with its respective completed car wash

<b>ID</b>	12
<b>Description</b>	Business manager sets car wash region
<b>Actors</b>	Business manager
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• Business manager has downloaded Washu application</li> <li>• Business manager is logged in</li> </ul>
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• User taps on Set Car Wash Region</li> <li>• User enters approximate location into app to see map of area</li> <li>• User draws perimeter on screen to enclose car wash region</li> </ul>
<b>Exceptions</b>	User cannot draw into/over pre-existing region.

<b>Business validations/Rules</b>	User cannot draw into non-populable or vehicle accessible area eg. bodies of water, forests
<b>Postconditions</b>	Car wash region is registered with business

<b>ID</b>	13
<b>Description</b>	Business manager creates car washer profile
<b>Actors</b>	Business manager
<b>Preconditions</b>	Business manager is logged in
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• User taps on Create New Car Washer</li> <li>• User fills out car washer profile information</li> <li>• User assigns car washer to car wash region</li> </ul>
<b>Exceptions</b>	Invalid profile form entry eg. missing digits for valid phone number, missing “@” for email address
<b>Business validations/Rules</b>	User profile cannot contain profanity
<b>Postconditions</b>	Car Washer is registered

<b>ID</b>	14
<b>Description</b>	Business manager looks at car washer and car owner reviews
<b>Actors</b>	Business manager
<b>Preconditions</b>	Business manager is logged in
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• User opens list of completed car washes</li> <li>• User taps on chosen car wash to see details</li> <li>• User taps on See Review</li> </ul>
<b>Exceptions</b>	No car washers registered, or no car washes completed
<b>Business validations/Rul</b>	N/A

<b>es</b>	
<b>Postconditions</b>	N/A

<b>ID</b>	15
<b>Description</b>	Business manager contacts customer
<b>Actors</b>	Business manager
<b>Preconditions</b>	Business manager is logged in
<b>Basic Steps</b>	<ul style="list-style-type: none"> <li>• User taps on the wash with desired customer from list of complete washes</li> <li>• User taps on contact customer</li> <li>• User chooses option to contact customer by message through the application, or through email, or phone number.</li> </ul>
<b>Exceptions</b>	N/A
<b>Business validations/Rules</b>	N/A
<b>Postconditions</b>	Business manager sees form to send message to customer through Washu, or user email application is opened, or voice call application is opened

## Deployment Diagram for the Washu app

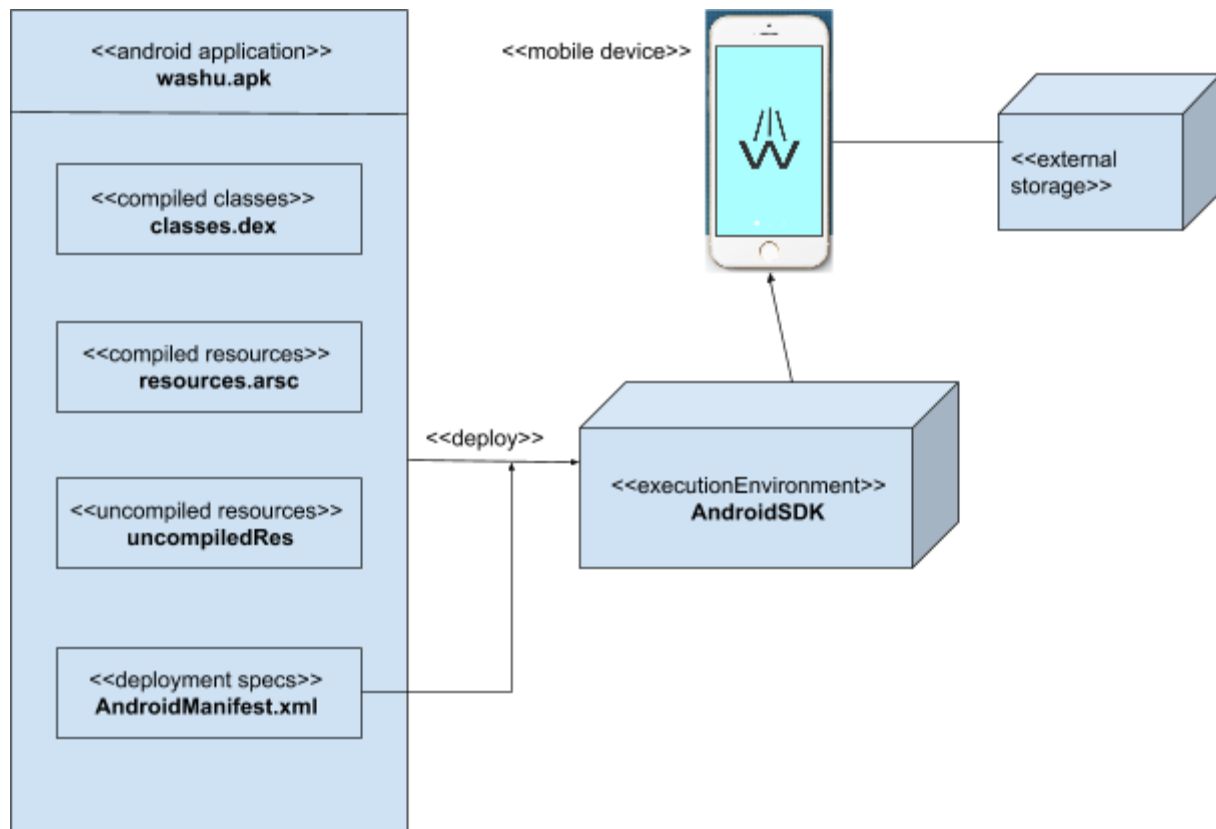


Figure 2. Deployment diagram for Washu system.

The “manifest” file **AndroidManifest.xml** describes application requirements, such as the minimum version of Android required and any supported hardware configurations, and it also declares all components in the application.

The external storage box is optional, with Android API Level 8 or later, application could be installed on the external storage (SDcard), this could be requested for the specific application using a manifest attribute. The default setting is that applications are installed on the internal storage

# Activity diagrams

## Manager activity diagrams

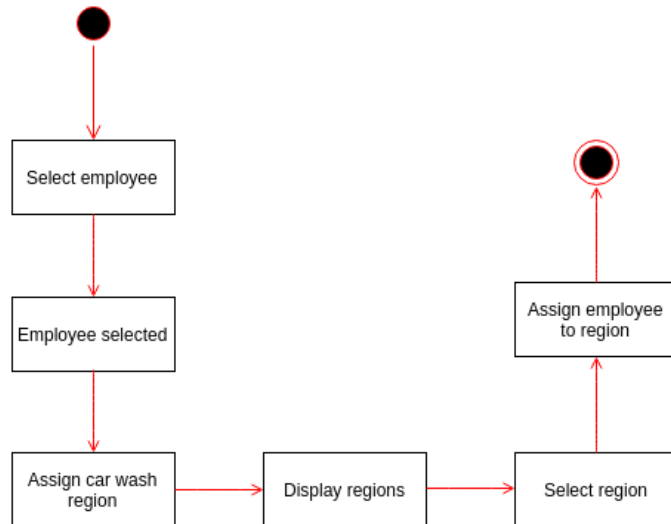


Figure 3. Activity diagram describing the process of a manager adding a washer to a region.

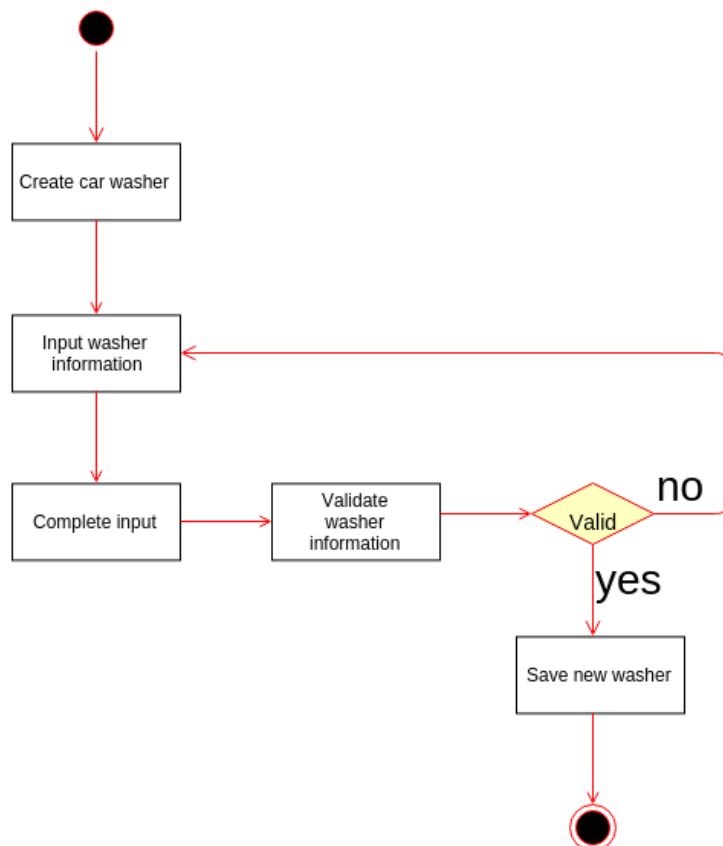


Figure 4. Activity diagram describing the process of a manager adding a new car washer account.

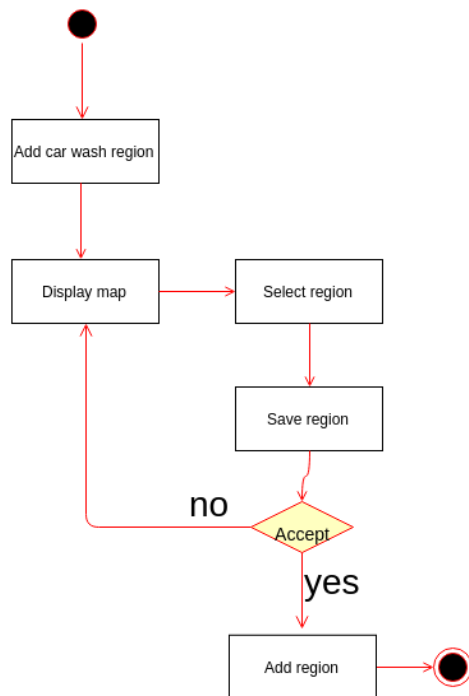


Figure 5. Activity diagram describing the process of a manager adding a new region.

## Customer activity diagrams

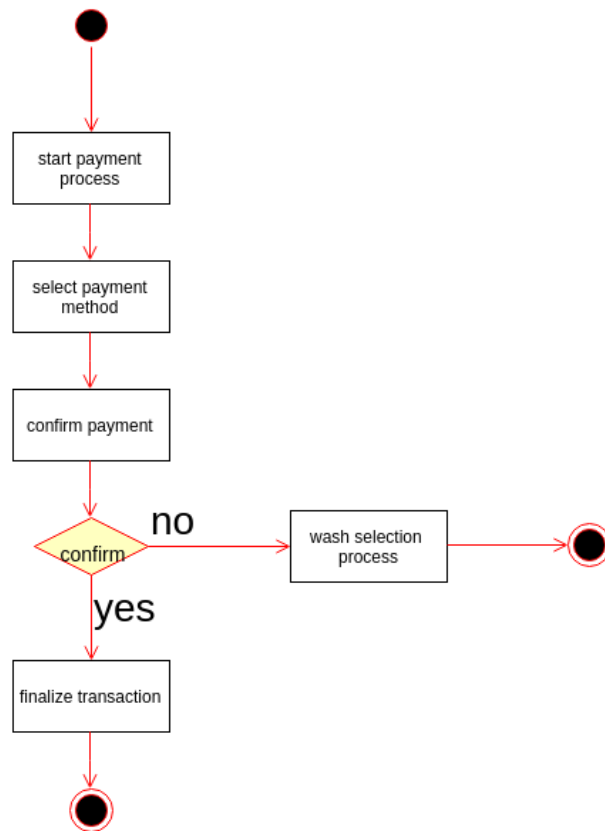


Figure 6. Activity diagram describing the process of a customer completing the payment for a car wash.

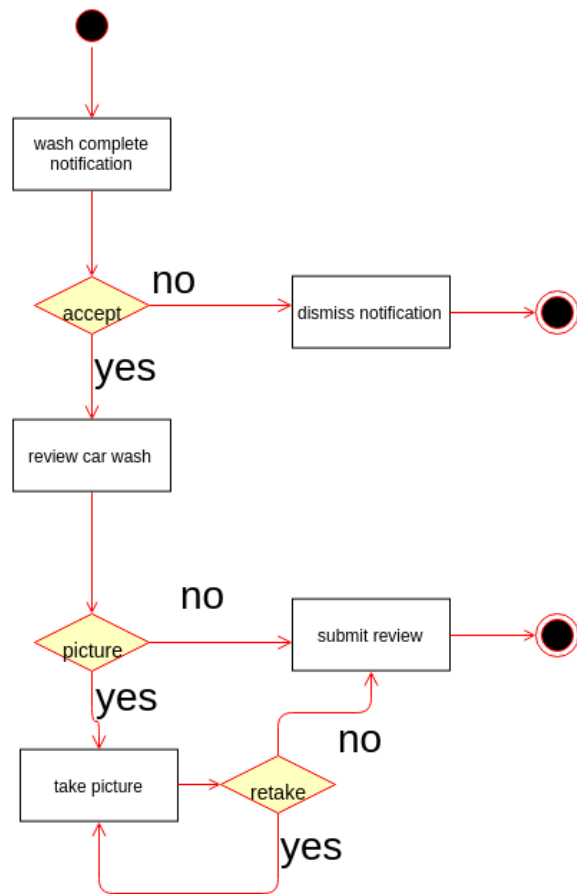


Figure 7. Activity diagram describing the process of a customer reviewing a completed car wash.



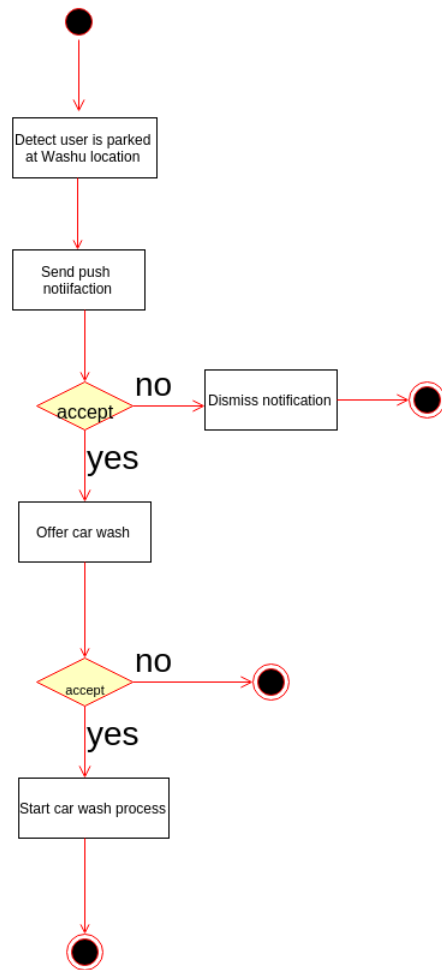


Figure 8. Activity diagram describing the process of a customer receiving a car wash notification.

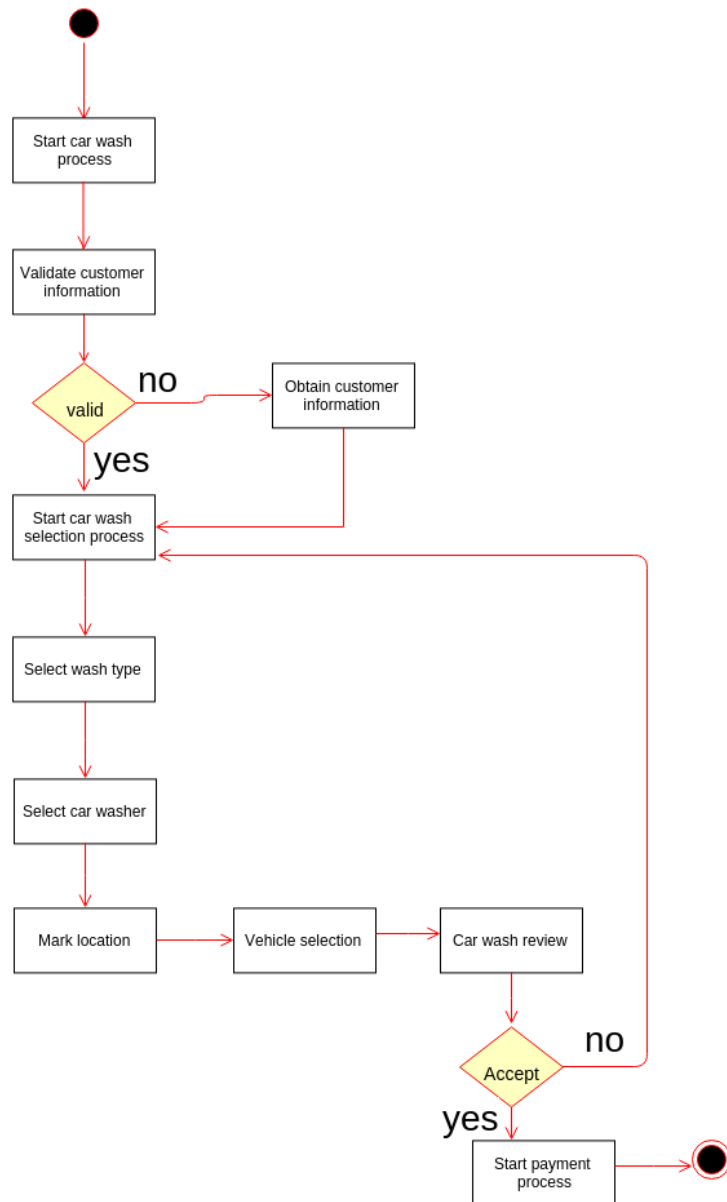


Figure 9. Activity diagram describing the process of a customer selecting a car wash and washer.

## Car washer activity diagrams

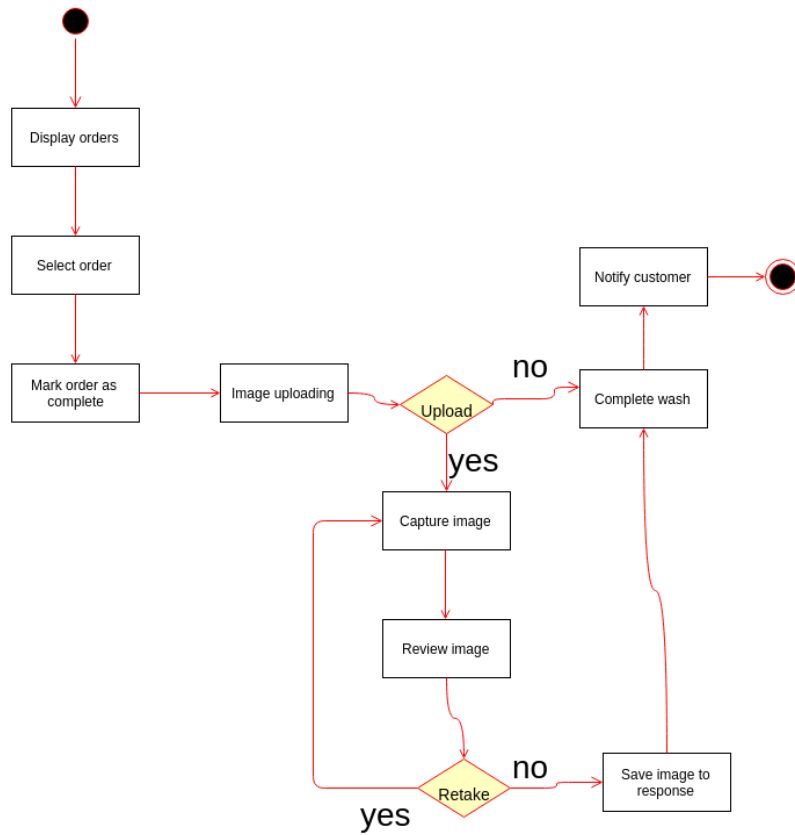


Figure 10. Activity diagram describing the process of a car washer marking a car wash as complete.

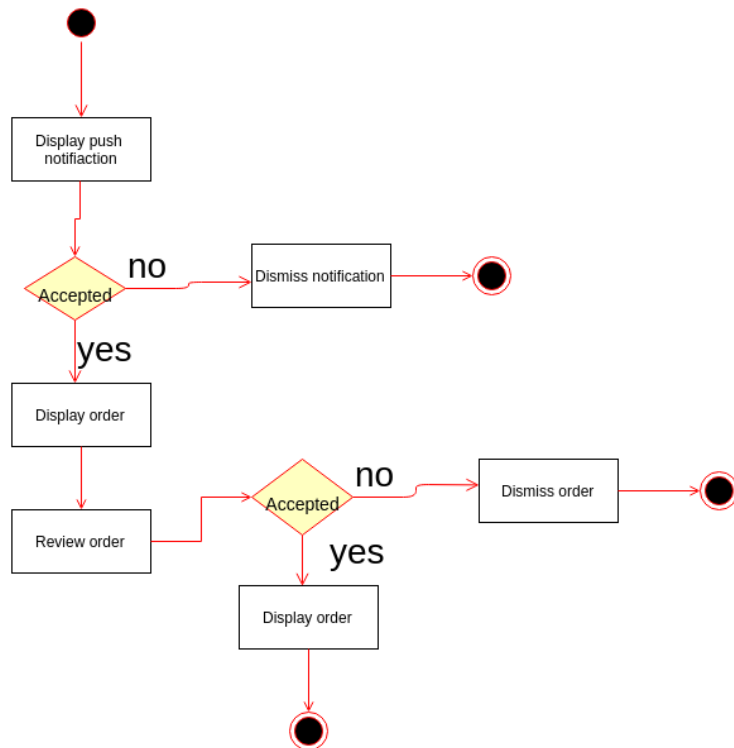


Figure 11. Activity diagram describing the process of a car washer receiving a new job notification.

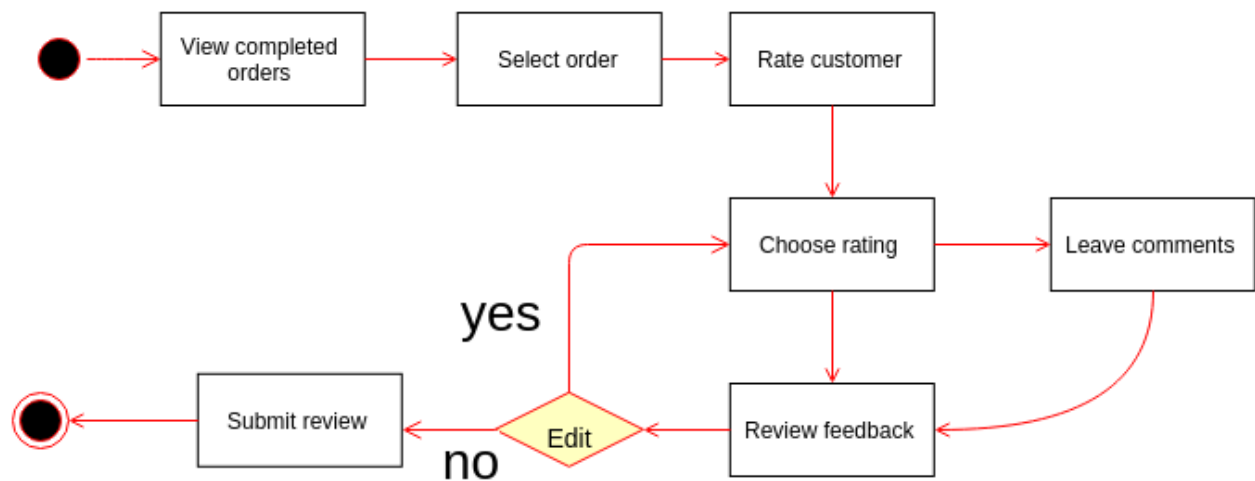


Figure 12. Activity diagram describing the process of a car washer reviewing a customer.

## state machine diagrams

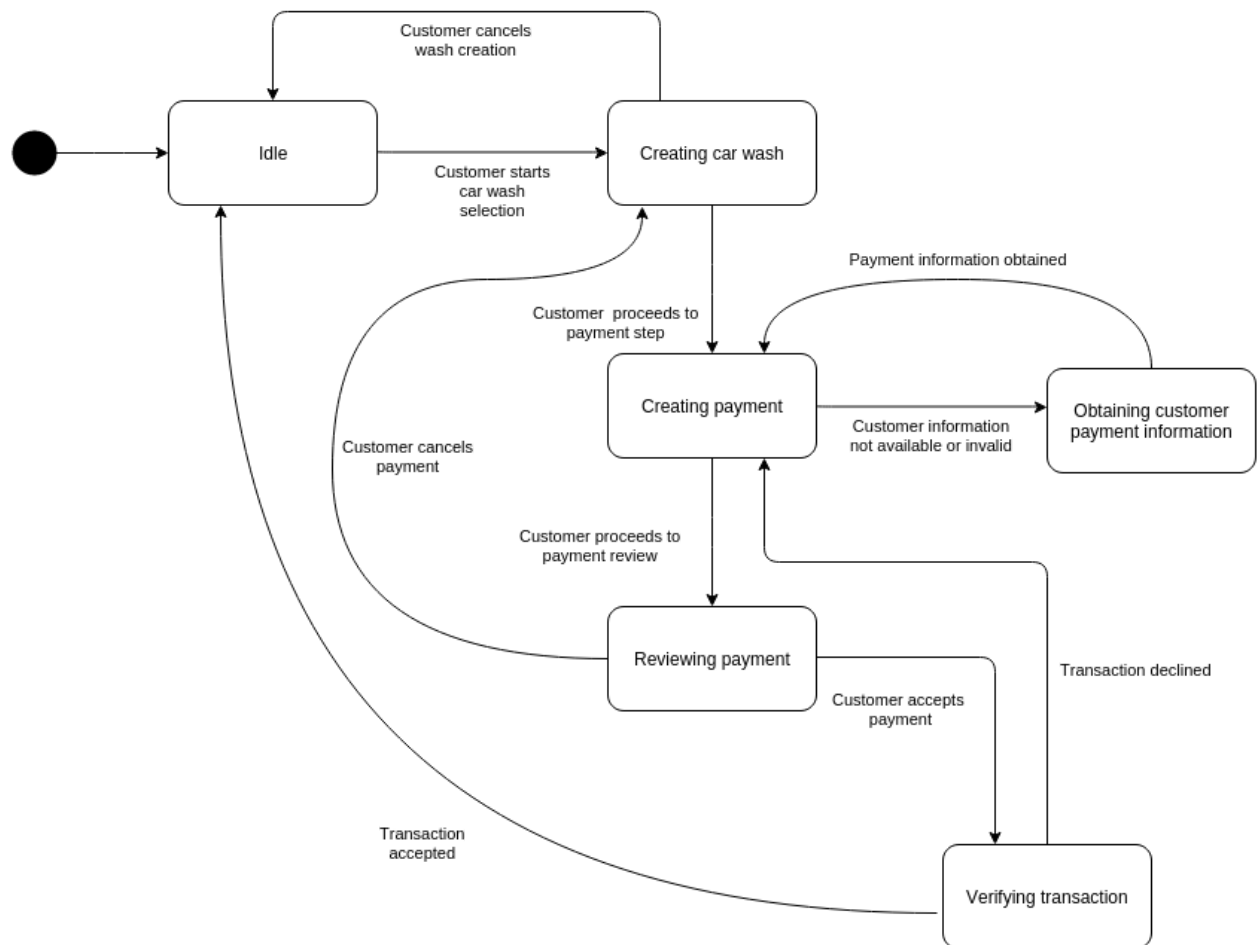


Figure 13. State machine diagram describing the customer car wash ordering process

# Sequence diagrams

## Car Owner Registration

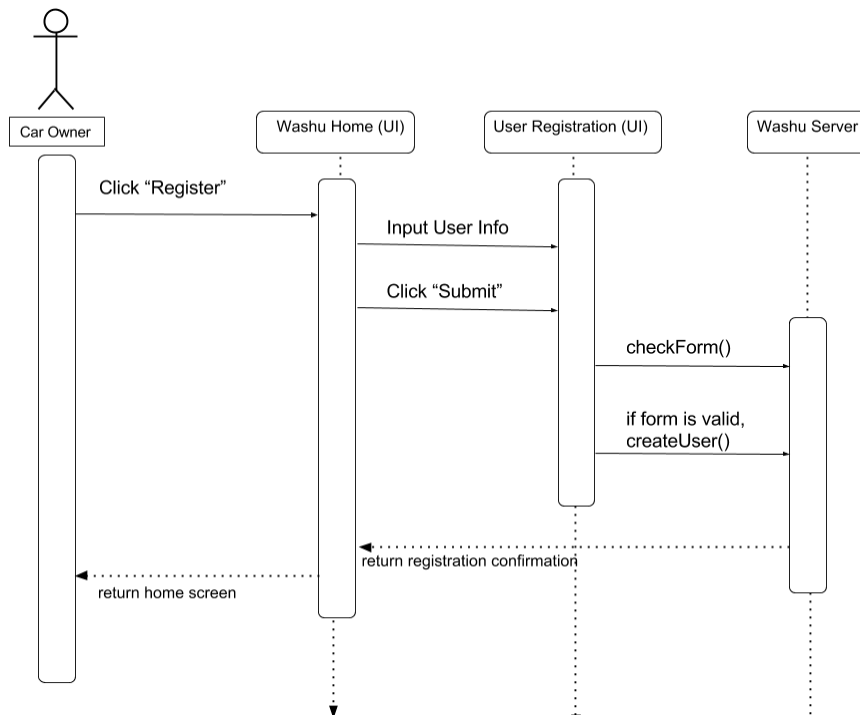


Figure 14. Sequence diagram describing the care owner registration process.

## Car Washer Registration

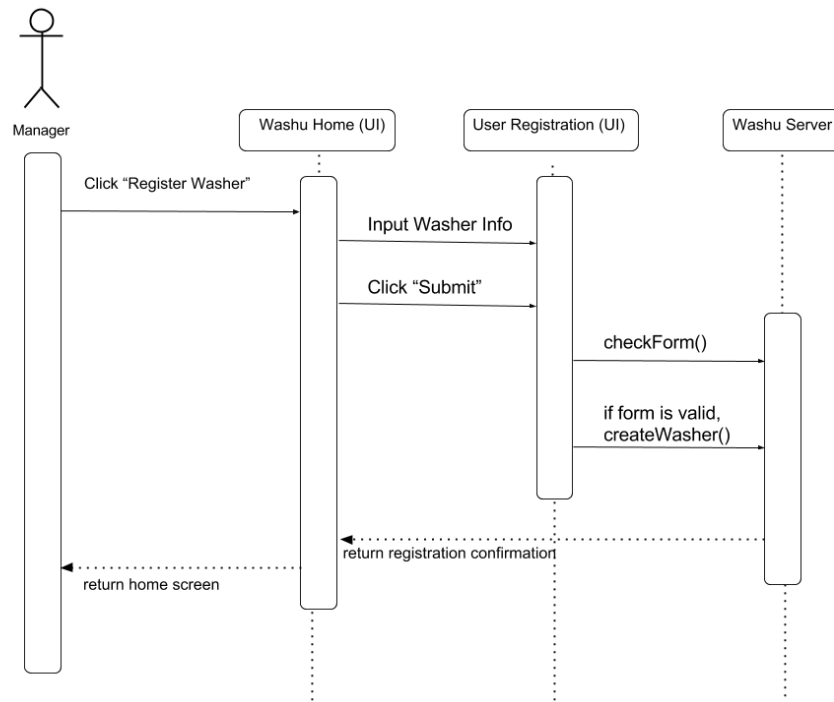


Figure 15. Sequence diagram describing the car washer registration process.

## Car Wash Ordering

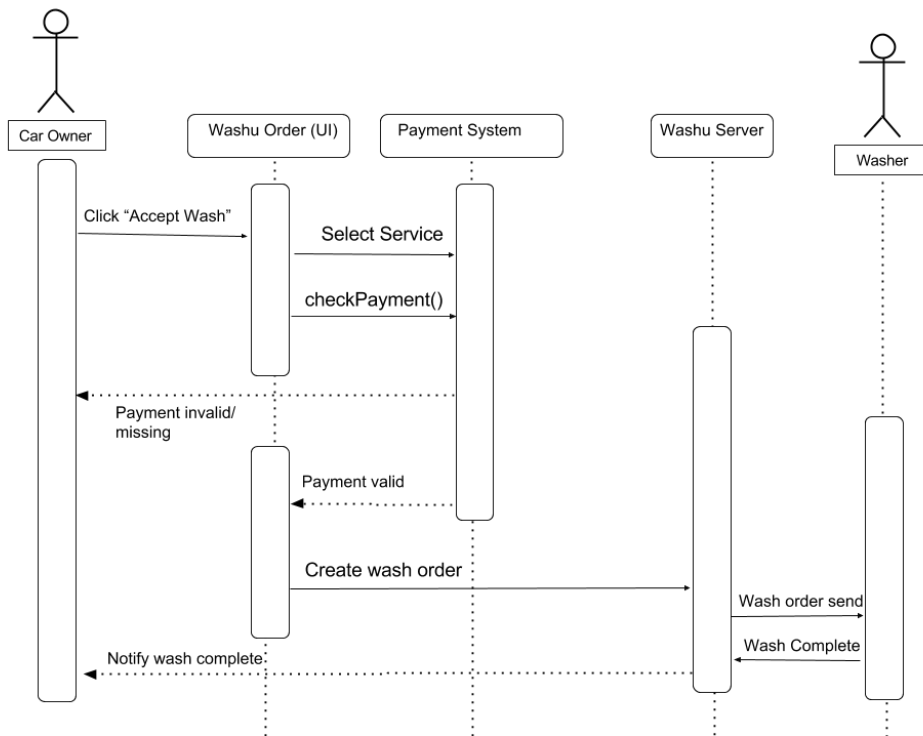


Figure 16. Sequence diagram describing the car wash ordering process in the Washu system.



## Uploading Images

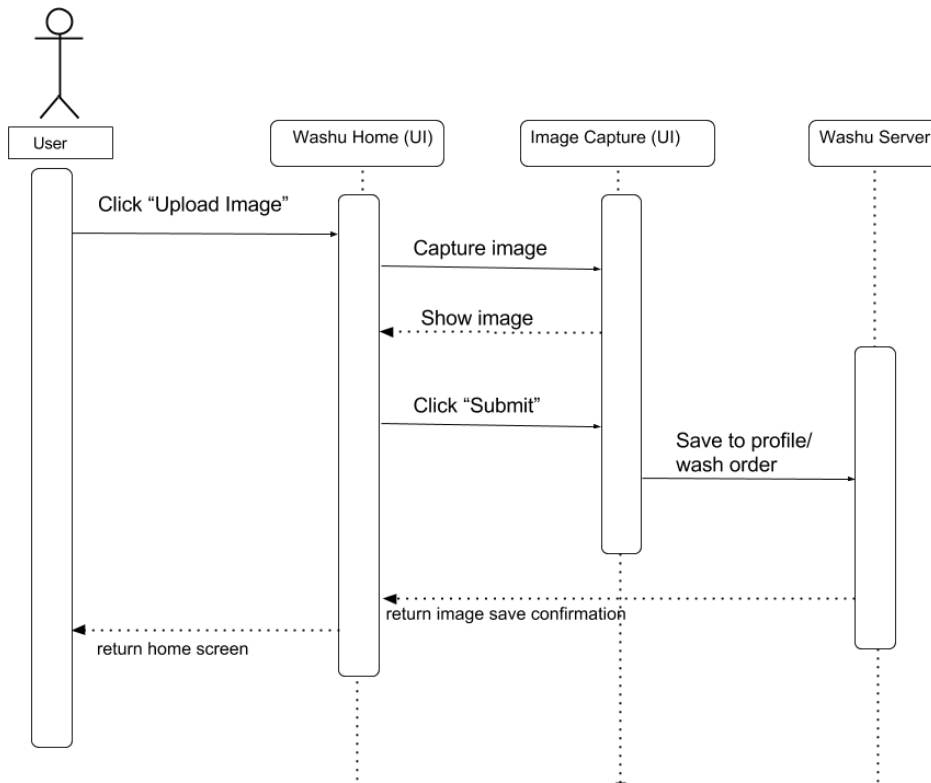


Figure 17. Sequence diagram describing process of a user capturing and uploading an image of their car to the Washu system.

## Setting the Washu Wash Region

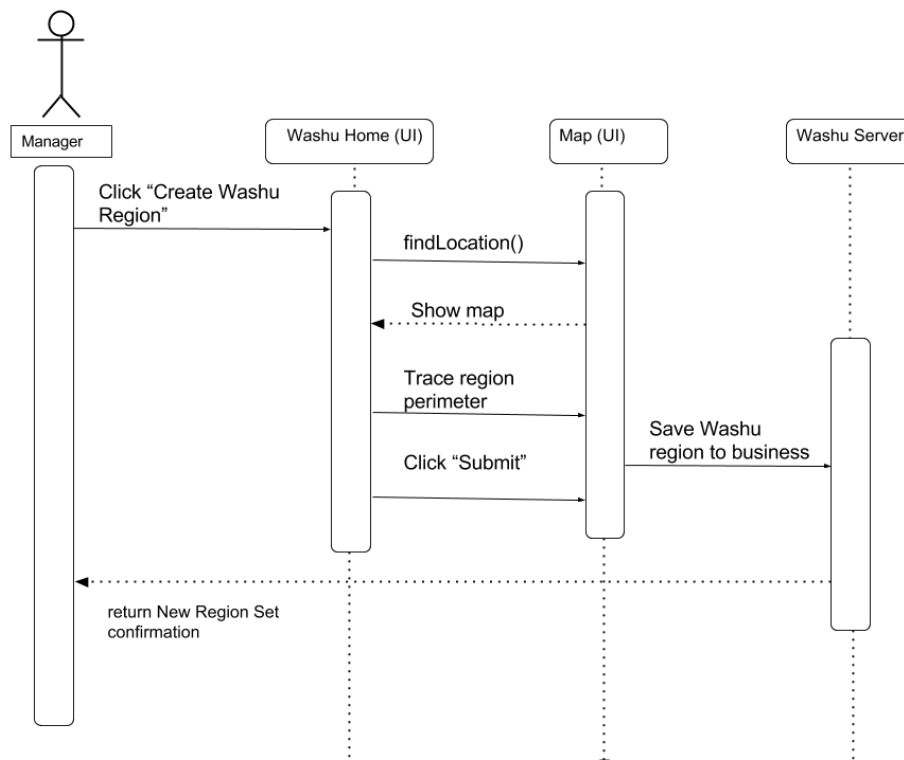


Figure 18. Sequence diagram describing process of a manager setting a Wahu car wash region for their organization.

## Customer car wash rating submission

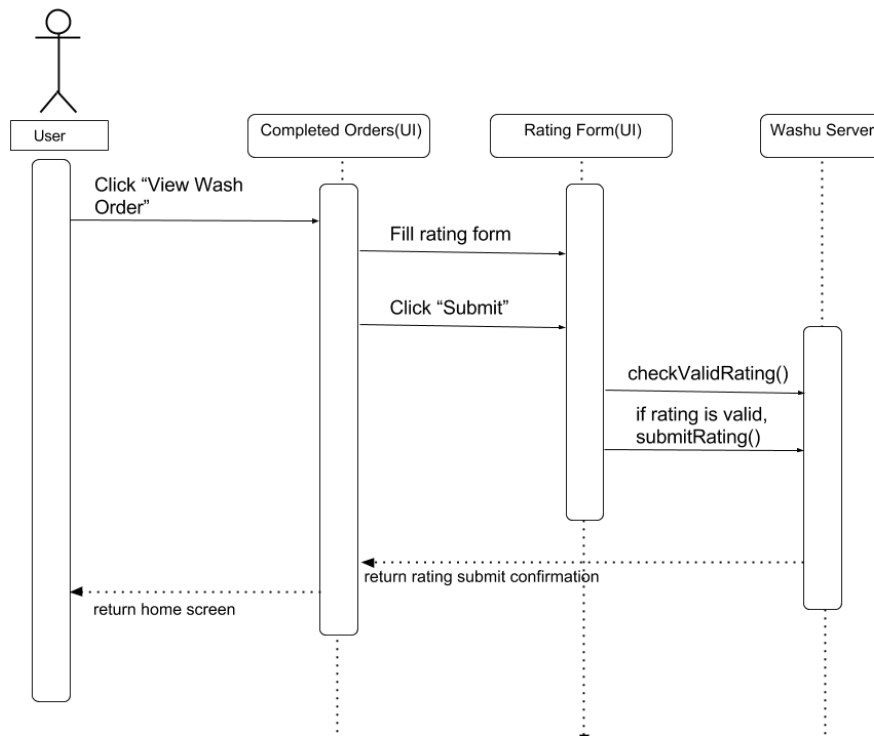


Figure 19. Sequence diagram describing the process of a customer reviewing a car wash that they received.

## class diagrams(RICHARD)

## Functional Specifications

TaxiCorp proposes Washu, a car wash application in response to Kraaken's Request For Proposal for an application developing team. Washu will be produced as an app for Android 4.0 Ice Cream Sandwich in order to reach the largest Android user base while providing the necessary functionality as specified by the client. The application will meet an underserved market made up of car owners.

The app will be licensed to malls and business owners where there is available parking for customers. The app will notify users parked at these Washu licensed businesses that a car

wash service is available, and offer various types of washes to choose from while the customer is away on their errand.

The project will satisfy a need for increased convenience in today's fast moving, tech-driven world. It aims to remove the idea of a user having to travel to access a service; Washu instead joins the on-going trend of the service brought to the user. Car washes are a means of care for a piece of technology that can have important roles in people's lives. These roles can include accessing employment, education or recreation. Traditional car wash services require the user to either find their own time and use their own efforts, or to bring their vehicle to a dedicated car wash location. This imposes a convenience constraint for the car owner as the car is out of service for the duration of the wash. The Washu application allows users' cars to be washed when it is already planned to be sitting for an extended period of time. This maximizes convenience so the user can spend their time focusing on other important duties in their lives.

Washu also provides benefits to the licensee of the application. A business whose parking lot is licensed will draw customers from unlicensed competitors. It is an extra service that is provided and is supported 24/7 from Washu. A licensed business will then see increased revenue from the implemented system. Washu will fill a hole in the car washing market, and its beneficiaries will be those who seek a new, convenient car washing model to either access or implement.

The users of the application are car owners, Washu licensed car washers, and Washu licensed business managers. Car owners will be able to use the app to set up an account, order a car wash when notified that a Washu service is available, rate their wash, and provide payment. Car washers will use the app to receive notifications that a wash is requested, rate the requesting customer, and mark a wash as completed. Business managers will use the app to set a region such as their parking lots where the car wash service will be available, create and assign car washer employees to car wash regions, view car wash ratings and access customer contact information to address comments or concerns.

The system's most important features include GPS triggered push notifications to let users know that a Washu car wash service is available in the area. GPS will also be used to let the customer mark the location of their car so washers can find and prioritize their washes. The app will allow users to create and customize their own profile that includes payment information and

car model. Car washers can also create their own profiles, which customers can review. Users will be able to upload pictures of their car for identification, or to report a wash that does not meet satisfactory specifications. A secure payment system will be implemented so users can pay for their wash within the app.

Washu will be run on mobile applications that support Android 4.0 Ice Cream Sandwich. Hardware systems supporting Ice Cream Sandwich also support features the application requires such as notifications, GPS and camera access. The Washu application should have the above mentioned features but also meet required performance specifications. The payment system will be very secure, as not to leak any customer data regarding car ownership or payment information. Functionality such as GPS location will be available during business operating hours.

## **User Interaction**

### **Customer/Car Owners**

#### **Set up customer profile account**

When initially opening up the Washu app, users will be requested to create and customize their own user profile. This will be done by a form with multiple fields where users can enter information. Users will fill in a profile name, contact information, and upload an image or multiple images of their car. An asterisk would appear beside mandatory fields. Contact information options include email and phone number. The customer will also need to fill in payment information. Payment information does not need to be supplied until a car wash is ordered. An option to save payment information such as a Stripe, interac, or credit card number will be supplied. The app would also be able to collect PayPal information to handle payment. A red border will appear around fields that are required but missing or not entered correctly eg. incorrect amount of digits for a phone number, missing “@” for an email, invalid credit card number.

## **Car Wash Ordering**

Users will receive a push notification on their mobile device when they are in a parking lot region that supplies the Washu car wash service. Car wash zones will be determined through GPS tracking.

Upon opening the app after a notification has been received, the customer will be presented with a message requesting acceptance for a car wash. If the customer has not yet submitted payment information such as a credit card, a view will appear requesting this information be entered. The app will check for valid information before allowing the customer to proceed.

If the user decides to order a car wash, the user will see available car washers and available car wash services. The customer will be able to view different washers and read their ratings and reviews. Customers will also be able to go through different car wash services and see them in more detail. Detailed view will include the full extent of washing and their prices. Tapping on a washer will select them for a wash. Likewise, tapping on a wash service will place an order for that particular wash service.

Once a car wash service and washer are chosen, the customer will be asked to mark the location of their car within the app. The application will use GPS for marking. The customer will be presented with a view of the available car wash region and be able to tap on it to mark their car location. The customer would also be asked to select the vehicle they would like to wash in the case where they have more than one car linked to their profile. This will allow car washers to locate the customer's vehicle once the order is sent. Before the car wash order is finalized, the customer will be able to review their order to ensure their selection is correct.

## **Payment**

The customer will receive a request for payment once a the car wash order is finalized. The customer will be presented with a view to select one of the payment options they have set up for their profile. The customer will select their payment method by tapping on the option to highlight it, and then submit the payment by tapping on a "Confirm Payment" button. If a payment option is not selected, an error message will display noting that a payment method is not selected.

Once a payment is successfully submitted, the customer will be displayed a message stating the transaction was successful and thanking them for their business. Successful payment will result in a notification sent to a car washer to notify them that a wash has been ordered.

## **Rate Car Wash**

Once a car washer has marked the wash as complete, the user will receive a notification that their car is ready for review. Opening the app after receiving a car wash complete notification will present the customer with a view to rate and comment their wash. The customer will review the completed car wash in person and rate the wash with a 5 star rating system. A rating of 5 will let the business and washer know that the service was exceptional, while a rating of 1 will express an unsatisfactory wash. A star rating is required, while a comment is optional. The view will be a form with fields for a rating, a comment, and a submission button. Submission will not be sent until a rating is chosen. Tapping on "Submit" with a void rating field will result in a red border around the rating field and a notification that a rating is required.

If a rating of less than 3 is received, the customer would have the option to submit a picture of the car to indicate the terrible quality. The customer will tap on "take a photo" which will open the device's camera. After a photo is taken, the customer can either retake or choose the photo for submission. The photo will then be uploaded to the order review for the car washer and business manager to see.

## **Customer Support**

The app will allow customers to request customer support. The various options for customer support will include contact through email, contact through phone or a live chat session. Selecting the live chat option will result in the customer seeing a slide-up window for an open chat session. If a customer service representative is not present, the chat window will say "No customer service representative available; Please try again later or use email contact." It will then show the available time slots for a live chat session.

# **Washu Car Washers**

## **Receive Wash Request Notification**

Washu Car washers will receive a push notification on their version of the mobile app once a customer requests a car wash. A notification will be sent to the customer chosen washer designated to the parking lot where the customer has parked. Upon opening the app, the washer will be presented with a view of the order information, along with the customer information. The car washer will be able to view the customer's ratings and reviews in order to determine at their discretion whether they will want to take on the car wash job or not. Buttons for "Accept order" or Decline order" will be presented, and the washer will make their selection by tapping on one.

If the requested car wash is declined, a notification will be sent to the customer. The customer will then be required to request a wash from another available washer.

If a requested car wash is accepted, the washer will be shown the location and a picture of the vehicle to be washed and the kind of wash service requested. The washer can then prepare wash materials and schedule the wash according to priority determined by available time, estimated wash duration and location of the vehicle.

## **Mark Car Wash As Complete**

Once the washer has completed the car wash, they can mark the wash as complete within the app and a notification will be sent to the customer. The washer will open the app, select the order, and tap on the button "Mark as Complete." The washer will then receive a request to upload an image of the vehicle. The washer can take an image of the newly washed car to be sent with the completion notification to the customer. The app will request to use the mobile device's camera. Once an image is taken, the car owner can confirm the image or retake another one. Once an image is confirmed, it will be uploaded to the Washu app and sent to the customer to view.



## **Car owner rating**

Car washers will be able to rate a customer after a car wash has been completed. A 5 star rating system will be used. A rating of 5 stars will let other washers know that this customer does not pose any problems. A rating of 1 star will be used in cases where the customer treats the washer poorly or is dishonest in profile or payment information and causes service disruption. The car washer will be able to open a past order by tapping on it after it has been marked complete and click on a “Rate Customer” button. The washer will be presented with a form with fields to choose a rating, and leave a comment. The comment field will be optional. After the customer review has been filled out, the washer will tap on the “Submit” button. If a rating has not been chosen, a message will be displayed noting that a rating is missing and is required before a submission can be sent. After successful submission, the washer will be displayed a message saying “Customer rating submitted.”

## **Receive Rating Information**

A push notification will be sent to the washer once a customer has paid and submitted a rating. The car washer will then be able to view the rating submission in their view of completed washes. The washer can view an order rating by clicking on a completed order. The washer will then see a view of the order information, such as time of wash, wash duration, customer information and any uploaded images. The customer rating of 1-5 stars will be displayed, along with a comment if the customer submitted one.

## **Business Managers**

### **Set Car Wash Region**

The business manager using the Washu application will be able to set up regions where the car wash service will be available. The manager will be presented with an button “Add car wash region.” Clicking on the button will result in the application displaying a map of the business location determined by its address. The manager will then be able to mark on the map the regions where customers will be able to receive car washes. The manager will draw a continuous line enclosing the area on the map. A line will be traced on the map for visual

feedback. If an enclosed region is not properly marked, an error message will display stating “An enclosed region was not traced. Please try again.” After marking, the manager will see a message with buttons for “Save Car Wash Region” or “Cancel.” Tapping on “Save Car Wash Region” will save the region to the manager’s account. Tapping on “Cancel” will return the manager to the main Washu screen. When a customer with the Washu app enters a marked region, they will receive a notification on their mobile device that the Washu car wash service is available.

## **Create Employee Accounts**

The business manager will be able to create employee accounts. These employees will later be assigned to regions where the car wash service is available. A new employee is created by tapping on “Create Car Washer.” The manager can then input the employee profile information in their respective fields such as name and contact information. After the required fields are filled, the manager will click on a “Save Employee” button to save the employee. If a required field is not filled, an error message will be displayed before the employee account is created and stored with Washu.

## **Assign Car Wash Employees**

The manager will be able to assign an employee a car wash region once an employee profile is created. The manager will select an employee, and then select “Assign Car Wash Region.” The manager will be able to see the available car wash regions, and which employees are already assigned to each region. The manager can then choose a region and the employee will be assigned to work in that region. This information will be updated for the car washer on their view of the Washu app.

## **View Customer Review**

Customer reviews will be available for the business manager to access. This will be done by opening up the list of employees, and then tapping on “Reviews.” The manager will then be able to see a list of ratings and comments that customers have left for that particular car washer. This will allow the business manager to ensure that their service is being held to customer satisfaction. Alternatively, the manager can open the list of completed orders, and see complete

order information including time and date of wash, and customer and washer information including their ratings and reviews.

## **Contact Customer**

The business manager will be able to contact a customer who has ordered a wash through the app. This will be done by accessing the reviews and ratings in the completed orders view, and tapping on “Contact Customer” for a particular review. The manager will then be able to see the customer’s email and phone number if provided, and an option to open a live chat messaging system through the app. The manager will be able to send an email through the app by filling in a form. Once an email form is completed and sent, the customer will receive a notification that a message from the business manager has been received. If a live chat is initiated, the customer will receive a notification that a Washu live chat has been requested. The customer will then be able to open the app and accept the live chat request.

# **Management Plan**

## **Breakdown of Different Features**

The entire system will consist of several features:

- Location detection and location-based prompting:
  - The mobile app will detect, based on the user’s GPS location, whether or not the user is parked at an equipped business. If so, the app will send emit a push notification on the user’s mobile device that will advertise the availability of car washes at their location. Interacting with the push notification will allow the user to purchase a car wash within the app.
- Wash type selection:
  - The mobile app will display the types of car wash available at their location, and allow the user to select a type of car wash.
  - The user will be able to view and select a wash type regardless of whether or not they were prompted for a car wash by the app.
- Account creation and payment information association and persistence:

- The system will require the user to create an account through the mobile app in order to use the service.
  - The user's account will store their payment information for use in subsequent car wash transactions.
  - The user will remain logged into the mobile app after account creation or logging in unless they explicitly log out.
- Automobile pictures and description:
  - The mobile app will allow users to upload a picture of their car and license plate, which can be associated with their account for use later.
  - The mobile app will prompt the user to take a picture through the camera's phone upon purchase of a car wash if the user does not already have an associated picture.
- Provide a separate interfaces for each role:
  - for car washers, providing washers with the type of wash, car and license plate pictures.
- Car washer (employee) interface:
  - The mobile app will provide a separate interface only available to users who are car wash employees.
  - The employee interface will provide the user with the details of the next car in line to be washed, and the ability to indicate that a car wash has been finished.
  - Car washers can rate customers.
- Reviews
  - Customers will be able to submit and view reviews from other customers.
  - Car washers will be able to view feedback from customers.
- Automatic Completion notification
  - The app will automatically send the user a push notification on their mobile device when their car wash has been completed.
- Management interface
  - Managers will be able to
    - Manage car washers,
    - View customer reviews,
    - Contact customers.

## Minimum Viable Product

An expected minimal system to be completed by the end of the term will be a working prototype. This includes a functional Android application for the Ice Cream Sandwich OS that can be run and have basic features and a basic user interface. The prototype will have enough functionality to set up profiles for both customers and car washers, and send notifications between them.

This minimal system will have the car washer receive notifications that a customer has requested a car wash. This requires

This system will also have the customer receive notifications that a car wash has been completed by a washer.

If system implementation goes well, the application will have enhancements such as notifications based on GPS, and the option to access the device's camera to take a picture and upload it to the application.

Functionality that is not expected to be implemented at the end of term but will be nice to include are a rating system and a payment system.

## Team structure and responsibilities

Chris Kelly	- Project lead
Adewale Adekoya	- Webmaster/Developer
Richard Lui	- Washu App Designer and Programmer
Trison Nguyen	- Document writer

## Glossary of Terms

GPS	- Global positioning system; a space based positioning system that provides location and time information in all weather conditions
App	- A mobile phone application

OS	- An abbreviation for Operating System
Prototype	- An early sample, model or release of a product built to test a concept
Push notification	- A notification that appears on the home or lock screen of a mobile device, used to notify the user of new events when the user is not actively using the notifying application.

## Executive Summary

In today's fast-paced culture, people have more commitments and less time for other activities. One such important but often neglected activity is washing one's car. The Washu app aims to provide higher revenue to businesses, jobs to car washers, and convenience to the general public by allowing people to have their car washed while they shop.

Businesses owning parking lots can obtain a license to provide Washu car wash services at their parking lot. Users can download a mobile app, which will notify the user whenever they are parked in a licensed parking lot, allowing them to have their car washed while they are away. When the customer requests a car wash, they take a picture of their car and license plate. Their payment is processed through the mobile app and a washer is dispatched to their car. Car wash employees will use the same mobile app with a special washer interface to find the next car to wash and to confirm when the wash has been completed. When their car is clean, the user will be automatically notified on their mobile device, allowing them to know when they can come back to their clean car. Users will be able to submit and view reviews of car wash businesses, building customer trust and ensuring accountability. On the other hand, car washers will be able to provide feedback on customers, allowing businesses to avoid troublesome customers. In addition, through the app, business managers will also be able to manage the car washing side of their business, including managing employees and contacting customers. Washu will allow users to spend time in more fun and productive ways than washing their car, while allowing businesses to make more money from their current property.