

**Trimester March/April, 2025**

**CSE6224 SOFTWARE REQUIREMENTS ENGINEERING**

**Project Part 1**

**Topic: Campus Ride-Sharing Platform with**

**Parking System Integration**

**Requirements Elicitation Report**

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1 Requirements Elicitation Plan

1.1 Selected Elicitation Techniques

Out of the many elicitation techniques, we decided to pick 3 of the most crucial to effectively gather key specifications and user expectations for the proposed system from our stakeholders.

1. Questionnaire

This technique helps to collect general opinions and preferences regarding parking and ride sharing features.

* Cost-effective and time-efficient
* Reaches a large number of respondents quickly
* Useful for identifying common issues and feature expectations

2. Interview

One-on-one interviews were conducted with selected stakeholders, including students, system administrators, and university IT staff to share thoughts and explore specific requirements in detail.

* Allows follow-up questions and clarification
* Provides detailed, context-rich insights
* Helps understand workflows, exceptions, and stakeholder goals

3. Prototyping

Figma prototypes were developed to demonstrate possible layouts and overall of the system. These were shown to users for feedback and confirmation.

* Helps validate assumptions before implementation
* Encourages stakeholders to express preferences and UI concerns
* Useful in discovering hidden usability or feature gaps

## 1.2 Tools Used

2 Elicitation Execution and Findings

2.1 Summary of Elicitation Sessions

(provides an overview or summary of the elicitation activities you’ve conducted, typically includes a summary of what was discussed, the main points or insights gathered, and any key takeaways from those sessions. It is more about describing the process, context, and the outcomes from the sessions themselves, without delving into the specifics of the requirements.)

2.1.1 Questionnaire Session

To collect quantitative feedback from potential users of the Campus Ride-Sharing and Parking System, an online questionnaire was conducted using Google Forms. A total of **34 valid responses** were received from students and staff of Multimedia University, Cyberjaya.

The questionnaire was designed following the **Kano Model**, a well-established framework for categorizing customer needs. For each system feature, participants were asked to respond to a pair of questions:

* One **positive** question (e.g., “If this feature exists, how would you feel?”)
* One **negative** question (e.g., “If this feature does not exist, how would you feel?”)

Each question used a **5-point Kano scale**:

* I like
* I expect it
* I am neutral
* I can tolerate with it
* I dislike it

The questionnaire focused on 10 proposed features, such as login with student ID, illegitimate parking reports, parking space viewing, ride approval, and admin privileges. All responses were analyzed using a Kano evaluation grid to determine the correct classification of each feature: **Dissatisfiers (must-be) , Satisfiers (performance needs), or Delighters (excitement needs)**.

This survey was intended to:

* Validate which features are essential versus optional
* Guide feature prioritization in the Software Requirements Specification (SRS)
* Confirm whether the system design aligns with user expectations

**Key outcomes from the questionnaire included:**

* Login functionality, real-time parking visibility, and ride approval were consistently marked as **must-have features**
* Admin tools and interactive features were rated positively as **performance enhancers**
* Gamified elements and convenience features, such as booking faculty rides or viewing car owner details, were classified as **delighters**

2.1.2 Interview Sessions

Two interviews were conducted with students representing both key user groups of the system:

1. **Driver Interview**: Conducted with Sow Chien Yee, a student who regularly drives to campus
2. **Rider Interview**: Conducted with Ng Zai Kit, a student who doesn't own a car

The interviews followed a structured format with questions categorized according to the Kano model (Dissatisfiers, Satisfiers, and Delighters) to effectively identify and prioritize requirements. Each interview lasted approximately 5-10 minutes and explored both ride-sharing and parking system features.

**Summary of Key Findings:**

1. Drivers prioritize safety and prefer manual control over rider selection with gender filters
2. Riders value convenience and automatic matching with basic verification
3. Both groups are motivated by rewards and would use reporting features
4. Privacy concerns exist regarding sharing personal information in parking systems
5. Real-time parking information is highly valued by all users

2.1.3 Prototype Session

2.2 Categorized Requirements (Based on Kano)

Define the categories: Dissatisfiers, Satisfiers, Delighters   
Sort the requirements into those categories above then create the kano model

2.2.1 Questionnaire Session

Based on the questionnaire analysis, the following features were classified using the Kano model:

|  |  |  |
| --- | --- | --- |
| **Feature** | **Kano Category** | **Justification** |
| Login with Student ID and password | **Dissatisfiers** | The majority of users expected this as a basic requirement for secure access. Its absence caused high dissatisfaction. |
| Report illegitimate parking | **Satisfier** | Users strongly preferred this feature and found it helpful but could still accept its absence. |
| Rider can book a ride with a faculty member | **Delighter** | Viewed positively, but most respondents did not expect it as a standard feature. |
| Driver can override or empty a reserved parking spot | **Satisfier** | Seen as useful in real-world scenarios. Opinions were split on necessity, but users liked having the option. |
| Drivers can view available parking spaces and car plate details | **Dissatisfiers** | Strong expectation among respondents. Considered essential for parking navigation and validation. |
| Interactive school map with zoom | **Satisfier** | Considered helpful and practical, but not essential. Appreciated as a usability enhancement. |
| Drivers can accept or decline ride requests | **Dissatisfiers** | Strong agreement that this is a necessary control for safety and comfort, especially for drivers. |
| Admin login using Admin ID | **Dissatisfiers** | Considered a baseline administrative function. Strong dissatisfaction if unavailable. |
| Admin can view reported parking violations | **Satisfier** | Seen as valuable to enforce parking rules and respond to reports, but not a core system function for all users. |
| Admin can view car owner details | **Delighter** | Viewed as useful by some, but not necessary for most. Privacy concerns noted in free-text comments. |

2.2.2 Interview Session

**Dissatisfiers (Must-Have Requirements)**

These are basic expectations that cause dissatisfaction when not met:

1. **Ride Information Fundamentals**
   * Time of departure
   * Pick-up location and destination
   * Driver details (including picture)
   * Number of available seats
   * Cost/price information
2. **Safety and Verification**
   * University verification system for all users
   * Basic security measures
3. **Parking Information**
   * Real-time parking availability count
   * Map location of parking spots

**Satisfiers (Performance Requirements)**

These features increase satisfaction when provided and implemented well:

1. **Ride Approval and Matching**
   * Options for both manual approval (preferred by drivers) and automatic matching (preferred by riders)
   * Filters for gender and faculty (particularly important for female drivers)
   * Recurring ride booking capability
2. **Parking System Enhancement**
   * Best parking lot suggestions based on destination
   * Partial identification of vehicles in parking spots (opinions varied on privacy concerns)

**Delighters (Excitement Requirements)**

These are unexpected features that create high satisfaction:

1. **Incentive Systems**
   * Fuel savings and carbon footprint reduction metrics
   * Reward system (fuel compensation or redeemable points)
2. **Safety and Convenience Enhancements**
   * Location sharing with friends during rides
   * Rating system (particularly star ratings)
   * Illegitimate parking reporting with photo evidence

2.2.3 Prototype Session  
example

2.3 Observations and Notes

* General findings and interesting things noticed.
* Conflicting or ambiguous feedback.
* Anything that impacted what made it into the SRS.

2.3.1 Questionnaire Session

The following key observations were made during the analysis of 34 responses collected through the Kano-model-based questionnaire:

**General Findings and Interesting Observations:**

* Most users strongly expect **basic security and identity features**, such as login using student/staff ID, to be present. These were consistently rated as “must-be”.
* **Real-time parking visibility and ride request approval** were also perceived as baseline expectations.
* Users appreciated **interactive and visual features**, like a zoomable campus map and viewable license plate, especially for parking navigation.
* There was a **high positive response** to administrative control features, even among student respondents, suggesting a general appreciation for well-managed systems.

**Conflicting or Ambiguous Feedback:**

* Responses were mixed on the feature that allows **drivers to override or empty reserved parking spots**. Some viewed it as useful, others raised concerns about misuse or fairness.
* The feature to **book a ride with faculty members** was received positively by some users (as a novel idea), but others found it irrelevant or unnecessary.
* There were diverging preferences on **car plate visibility**—while many supported it for verification, others expressed privacy concerns.

**Impact on SRS:**

* Features that were strongly rated as "must-be" (such as student login, parking visibility, and ride control) were confirmed and prioritized in the functional requirement list.
* Features with conflicting feedback were either marked as **optional**, **configurable**, or **to be validated during prototype testing** (e.g., override parking, view car owner info).
* Delighter-type features, such as reporting parking violations or booking with faculty, were included as **enhancements**, not core functions, to balance scope and development effort.

2.3.2 Interview Session

* **Gender-based Safety Concerns**: Female drivers expressed significant preference for same-gender riders, suggesting safety filters are essential rather than optional.
* **Privacy vs. Accountability Balance**: Differing opinions regarding the sharing of personal information in the parking system highlight the need for careful consideration of privacy implications.
* **Verification Importance**: University verification appears to be a key trust factor that enables users to feel comfortable with the ride-sharing concept.
* **Economic Incentives**: Both interviewed users expressed that monetary incentives or rewards would significantly increase their motivation to use the platform.
* **Automatic vs. Manual Preferences**: There was a clear preference difference between drivers (preferring manual approval) and riders (preferring automatic matching), indicating a need for a hybrid approach.
* **Illegitimate Parking Concerns**: Both participants expressed strong interest in a reporting mechanism for parking violations, suggesting this is a common pain point on campus.

2.3.3 Prototype Session

3 Appendices

**3.1.1 Questionnaire Session**

The questionnaire was structured according to the **Kano Model** to identify which system features are considered essential, performance-enhancing, or delightful. For each feature, two questions were used:

* A **positive scenario**: *"If this feature exists, how would you feel?"*
* A **negative scenario**: *"If this feature does not exist, how would you feel?"*

### **Features Evaluated in the Survey**

A total of **10 features** were evaluated (20 questions total). These features covered login authentication, carpooling controls, parking features, and administrative functions.

|  |  |  |
| --- | --- | --- |
| **Feature** | **Positive Question** | **Negative Question** |
| Login with Student ID and password | If the system allows users to log in using Student ID and password, how would you feel? | If the system does not allow users to log in using Student ID and password, how would you feel? |
| Report illegitimate parking | If the system allows users to report illegitimate parking, how would you feel? | If the system does not allow users to report illegitimate parking, how would you feel? |
| Book ride with faculty | If the system allows students to book a ride with a faculty member, how would you feel? | If the system does not allow students to book a ride with a faculty member, how would you feel? |
| Override reserved parking spot | If the system allows drivers to override or clear a reserved parking spot, how would you feel? | If the system does not allow drivers to override or clear a reserved parking spot, how would you feel? |
| View parking spaces and plate info | If the system allows drivers to view available parking spaces and license plate numbers, how would you feel? | If the system does not allow drivers to view available parking spaces and license plate numbers, how would you feel? |
| Interactive school map | If the system provides a zoomable interactive school map, how would you feel? | If the system does not provide a zoomable interactive school map, how would you feel? |
| Accept/decline ride requests | If the system allows drivers to accept or decline ride requests, how would you feel? | If the system does not allow drivers to accept or decline ride requests, how would you feel? |
| Admin login | If the system allows an admin to log in using an admin ID and password, how would you feel? | If the system does not allow an admin to log in using an admin ID and password, how would you feel? |
| Admin view reported violations | If the system allows an admin to view reported parking violations, how would you feel? | If the system does not allow an admin to view reported parking violations, how would you feel? |
| Admin view car owner info | If the system allows an admin to view car owner information, how would you feel? | If the system does not allow an admin to view car owner information, how would you feel? |

Raw responses are included in the project GitHub in CSV format

**3.1.2 Interview Session**

Raw Notes or Transcripts



Two interview transcripts were collected:

1. Interview with Sow Chien Yee (Driver perspective)
2. Interview with Ng Zai Kit (Rider perspective)

The complete transcripts contain detailed responses to questions about ride-sharing preferences, safety concerns, matching preferences, parking system requirements, and feature priorities.

3.2 Survey Results or Interview Templates

**Survey Results for Questionnaire**

**Visual Summary of Kano Classification**

To better illustrate the outcome of the questionnaire-based analysis, the following chart summarizes the distribution of the 10 features across the three Kano model categories.

**Figure 1: Distribution of Features by Kano Category**

The pie chart below illustrates the distribution of ten system features across the three Kano model categories based on user feedback from the questionnaire. Each feature was analyzed using paired positive and negative questions to determine its perceived importance.

* Must-be (light green): Core features that users expect by default, such as login, ride approval, and parking visibility. Their absence causes significant dissatisfaction.
* Satisfiers (dark green): Features that increase satisfaction if present, such as illegitimate parking reporting and admin management tools.
* Delighters (yellow): Value-added features that pleasantly surprise users, such as booking with faculty or viewing owner information.

This chart highlights that most features were classified as Must-be or Satisfiers, indicating that user expectations are focused on core security and control functionality, while a few features offer opportunities for added user engagement.

A pie chart with text on it

AI-generated content may be incorrect.

**Figure 2: Feature Breakdown by Kano Category**

The following bar chart visualizes the Kano classification of each feature based on user responses. It shows that most features were considered either Must-be (essential expectations) or Satisfiers (performance needs), while a few were categorized as Delighters (unexpected but appreciated features).

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AI-generated content may be incorrect.**

**Interview Structure and Templates**

The interviews followed a structured format using questions categorized according to the Kano model. Two separate interview templates were created for the different user groups:

**Driver Interview Template:**

*Dissatisfiers (Must-Have Features):*

1. What information do you think must be required when offering a ride? (time/destination)
2. Would you feel safe letting someone you don't know join your car if they are a verified student? Why or why not?

*Satisfiers (Performance Features):*

1. Would you prefer to manually approve riders, or let the system match you automatically? Why?
2. What kind of filters would be helpful when matching with a rider? (gender/faculty/race)

*Delighters (Excitement Features):*

1. If the system could show you your estimated fuel saved or carbon footprint reduction, would that motivate you to offer more rides?
2. If you could earn a small profit or reward (fuel compensation/redeemable points for campus perks) for each ride you offer, would that make you more motivated to use the platform?

**Rider Interview Template:**

*Dissatisfiers (Must-Have Features):*

1. When requesting a ride, what details do you expect to see before confirming (driver name, student ID, car model, plate number)?
2. Would you feel comfortable getting into a car with someone you don't know if they are verified by the university system? Why or why not?

*Satisfiers (Performance Features):*

1. Would you like the system to allow recurring ride bookings? (max one day before)
2. When booking a ride, would you prefer to choose the driver manually, or let the system automatically match one for you based on location and destination? Why?

*Delighters (Excitement Features):*

1. If you could rate and review each ride experience, would you actually use that feature?
2. Would you use a feature where your friends can see your live location during the ride (optional)?

**Both User Groups Template:**

*Dissatisfiers (Must-Have Features):*

1. What do you expect when viewing the parking availability (real-time count, map location)?

*Satisfiers (Performance Features):*

1. Would it help if the app could suggest the best parking lot based on your destination?
2. Would you prefer to view claimed parking spots along with the name or plate number of the person who claimed it? Why or why not?

*Delighters (Excitement Features):*

1. If there was an "Report Illegitimate Parking" feature with photo upload, would you use it? Why or why not?

**Interview Summary Results**

The following tables summarize the key findings from the interviews:

**Driver Responses (Sow Chien Yee):**

|  |  |
| --- | --- |
| **Question Category** | **Key Response** |
| Essential Ride Information | Time of departure and destination location |
| Safety with Unknown Riders | Not fully comfortable, prefers female riders even with verification |
| Matching Preference | Prefers manual approval for convenience and efficiency |
| Filter Preferences | Gender and faculty filters preferred for safety |
| Fuel/Carbon Tracking | Would be motivated by this feature |
| Reward System | Confirmed this would increase motivation |
| Parking Information | Expects real-time count for immediate availability |
| Parking Suggestions | Found this feature helpful |
| Viewing Parking Claims | Prefers seeing name and plate number for contact purposes |
| Illegitimate Parking Reports | Would definitely use this feature to report common issues |

**Rider Responses (Ng Zai Kit):**

|  |  |
| --- | --- |
| **Question Category** | **Key Response** |
| Expected Ride Details | Driver picture, available seats, passenger count, and price |
| Comfort with Verified Drivers | Comfortable due to university verification |
| Recurring Bookings | Prefers this feature for convenience and avoiding rush |
| Matching Preference | Prefers automatic matching to save time |
| Rating Feature | Would use star ratings but not written reviews |
| Location Sharing | Would use for safety reasons |
| Parking Information | Values real-time information for convenience |
| Parking Suggestions | Sees this as a valuable and unique feature |
| Viewing Parking Claims | Prefers only plate number due to privacy concerns |
| Illegitimate Parking Reports | Would use to discourage illegal parking |

3.3 References

1. GeeksforGeeks (2025 April 2) Requirements Elicitation – Software Engineering , <https://www.geeksforgeeks.org/software-engineering-requirements-elicitation/>
2. ResearchGate (2016 April) The Elicitation Interview Technique: Capturing People’s Experiences of Data Representations  
   <https://www.researchgate.net/publication/287995118_The_Elicitation_Interview_Technique_Capturing_People's_Experiences_of_Data_Representations>