

**TRIMESTER March/April, 2025**

**CSE6224 Software Requirements Engineering**

**PROJECT 1**

**Campus Accessibility Navigation System with Facilities and Event Integration**

| Name | Student ID | Course |
| --- | --- | --- |
| Chia Kok Ang | 242UC24423 | Bachelor of Computer Science |
| Wang Kuang Wei | 242UC2451W | Bachelor of Computer Science |
| Sim Boon Xun | 242UC2451H | Bachelor of Computer Science |
| Hong Chia Qian | 1211107977 | Bachelor of Computer Science |

**Table of Content**

[**1. Elicitation Strategy 2**](#_fxcamzww9lal)

[1.1. Justification for Using the Kano Model Elicitation Strategy Overview 2](#_fh0rlv9v7uty)

[1.2. Classification of Requirement Using Kano Model 3](#_63ih8ipmk4m7)

[● Requirement Identification 3](#_d61v73vmjggi)

[● Design of Kano Questionnaire 3](#_n4wpdem41wxx)

[● Data Collection 3](#_a7ytsychui9z)

[● Data Analysis and Categorization 4](#_3z5d03662tlk)

[● Prioritization and Interpretation 4](#_hrhhs1e048hn)

[**2. Elicitation Execution and Findings 5**](#_6zxewkpffb5c)

[2.1. Summary of Elicitation Sessions 5](#_4mf36fmq3prh)

[2.1.1. Data collected 5](#_c0voaq30xrn5)

[2.1.2. Key observations 5](#_cc1ld270pr8)

[2.2. Categorized Requirements(Based on Kano) 6](#_as40ms6m5934)

[● Basic Needs 6](#_15k3t3csw2jl)

[● Performance Needs 7](#_ruc1ni34p4c3)

[● Excitement Needs 7](#_utyu572jve8f)

[● Indifferent Needs 8](#_6o104nj5uqpo)

[● Reverse Needs 8](#_kwowfrh6haid)

[**3. Appendices 9**](#_c4x249pb2czz)

[References 13](#_tm1j99rzjv5f)

# **Elicitation Strategy**

## **Justification for Using the Kano Model Elicitation Strategy Overview**

The Kano Model is a widely recognized and effective technique for classifying customer requirements based on their impact on customer satisfaction, and remains a popular method in requirements engineering and product development.

The main rationale for selecting the Kano Model in this elicitation process is its ability to distinguish between different types of requirements—such as basic needs, performance needs, and excitement needs—and how each category influences user satisfaction differently. Unlike traditional prioritization methods that consider only importance or frequency, the Kano Model helps to uncover latent customer desires that, when fulfilled, can lead to delight and competitive advantage.

By applying the Kano Model, the project team aims to:

* Identify and prioritize requirements that are critical to customer satisfaction.
* Differentiate between must-have features and those that provide unique value.
* Optimize resource allocation by focusing on features that maximize user delight.
* Gain a deeper understanding of user preferences through structured elicitation.

This strategy aligns with the project’s goal to deliver a product that meets essential expectations while also incorporating features that exceed user needs, thereby increasing the product's overall acceptance and success.

## 

## **Classification of Requirement Using Kano Model**

The classification of requirements using the Kano Model involves categorizing user requirements into distinct groups based on customer feedback collected through surveys and interviews. The process consists of the following key steps:

### Requirement Identification

Initial requirements are gathered from stakeholders using various elicitation techniques such as interviews, surveys, and prototyping .

### Design of Kano Questionnaire

For each identified requirement, the Kano questionnaire is designed to include two complementary questions. The first is a functional question that asks users how they would feel if the requirement or feature is present in the system. The second is a dysfunctional question that explores how users would feel if the same requirement or feature were absent. By gathering responses to both questions, the questionnaire effectively captures users’ positive and negative sentiments towards each requirement. This dual approach enables a comprehensive understanding of how the presence or absence of a feature influences user satisfaction, which is essential for accurate classification in the Kano Model.

### Data Collection

The Kano questionnaire is distributed to a representative sample of users via Google Forms and supplemented with qualitative insights gathered through interviews and feedback from prototyping sessions.

### Data Analysis and Categorization

Responses are analyzed using the Kano evaluation table to classify each requirement into one of the categories: Must-be (basic needs), One-dimensional (performance needs), Attractive (excitement needs), Indifferent, or Reverse.

### Prioritization and Interpretation

The categorized requirements are prioritized based on their impact on customer satisfaction and feasibility, providing a clear roadmap for product development.

This classification approach provides a structured framework to understand the varied impact of requirements on user satisfaction, enabling more informed decision-making in the development process.

# **Elicitation Execution and Findings**

## **Summary of Elicitation Sessions**

### Data collected

* **Interviews** with academic and administrative staff at MMU to understand current challenges and expectations related to campus navigation and facility management.
* **Surveys** administered to students, gathering quantitative data on navigation difficulties and desired features.
* **Prototyping sessions** allow stakeholders to interact with early system models, providing feedback on usability and feature preferences.A low-to-mid fidelity prototype of the system was developed using Figma, showcasing core functionalities such as navigation, facility browsing, event listings, and schedule viewing. This prototype was shared with multiple student participants who interacted with the interface and provided evaluative feedback from a student’s perspective. These sessions allowed the team to gather qualitative insights regarding user expectations, usability concerns, and feature preferences. Observations from these sessions were used to refine the questionnaire items and improve system design alignment with user needs.

## 

### Key observations

* Staff emphasized the importance of automated syncing with the university database to reduce manual workload and errors.
* Real-time updates on maintenance and event changes were critical for avoiding conflicts and improving communication.
* Both staff and students highly valued automatic, prioritized notifications to keep users informed without causing alert fatigue.
* Privacy concerns around tracking and data handling were consistently raised, underscoring the need for transparency and user consent.
* Customizable notification settings were favored to balance timely communication and avoid user overwhelm.
* Students face challenges with navigation due to construction and poor signage, underscoring the need for adaptive, real-time routing.

## Categorized Requirements(Based on Kano)

### Basic Needs

* + - Navigation to campus facilities and event locations
    - Accurate, accessible maps and route guidance (including for disabled users)
    - Event integration for knowing where and when things happen
    - Clear signage (digital or physical) and basic interface usability
    - Prototyping confirmed users rely heavily on clear and accurate visual cues and map data; any inconsistencies in the prototype maps were immediately noted as confusing.

### Performance Needs

* + - Real-time updates on event changes, facility availability, and maintenance
    - Automated syncing with university systems (timetables, calendars, etc.)
    - Personalized scheduling for users (e.g., students, staff)
    - Priority reminders and alerts based on user context
    - Strongly improve satisfaction and productivity, validated by prototype interaction where users appreciated instant event updates and syncing features that reduced manual workload.
    - The prototype’s demonstration of real-time data highlighted the critical role of timely and accurate information in decision-making for both staff and students.

### **Excitement Needs**

* + - Indoor navigation inside complex buildings
    - AR/voice-assisted guidance
    - Customizable notification filters (urgency, type, etc.)
    - Smart suggestions: “You have 15 mins before your next event nearby”
    - Prototyping feedback emphasized that customizable notifications significantly enhance user experience by reducing alert fatigue while keeping users informed—this feature was a standout in prototype testing.
    - Interactive elements like filtering event types and setting notification urgency levels were enthusiastically received.

### **Indifferent Needs**

* + - General campus news unrelated to navigation/events
    - Basic reporting tools (unless directly tied to navigation problems)
    - These were ranked lower in importance during both interviews and prototype evaluation, where users focused more on actionable, time-sensitive information rather than general news.

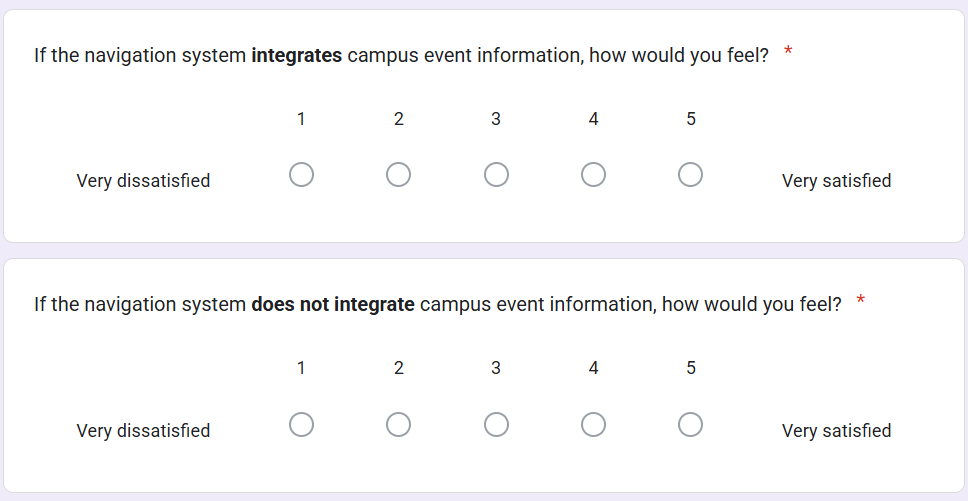
### **Reverse Needs**

* + - Too many or irrelevant notifications (alert fatigue)
    - Invasive tracking without clear consent
    - Overcomplicated setup just to access maps/events
    - Prototyping revealed that too many notifications without filtering caused annoyance; users explicitly requested control over notification volume and type to avoid fatigue.
    - Privacy concerns around tracking were echoed, with participants urging transparent policies and opt-in consent mechanisms.

# 

# Appendices

This figure shows a pair of functional and dysfunctional questions designed using the standard Kano Model format with a five-point Likert scale. Respondents indicate their satisfaction levels with and without a specific feature—in this case, the integration of campus event information into the navigation system. This format enables accurate classification of user preferences.



*Figure 3.1: Sample Kano Questionnaire Pair*

This table presents the final classification of system requirements using the Kano Model. Each requirement was categorized based on user responses from functional and dysfunctional questions, as well as feedback obtained through prototype evaluations. The categorization helps prioritize development efforts according to the impact of each feature on user satisfaction.

| **Requirement** | **Kano Category** | **Rationale** |
| --- | --- | --- |
| Navigation to campus facilities and event locations | Must-be | Users expect basic ability to navigate; any issues cause frustration. |
| Accurate, accessible maps and route guidance (including for disabled users) | Must-be | Prototype inconsistencies in maps were immediately identified as confusing. |
| Event integration for knowing where and when things happen | Must-be | Essential for time/location awareness of events. |
| Clear signage (digital or physical) and basic interface usability | Must-be | Clear visuals and intuitive UI were critical to user trust and usage. |
| Real-time updates on event changes, facility availability, and maintenance | One-dimensional | Enhances productivity; users favored immediate event/facility status updates. |
| Automated syncing with university systems (timetables, calendars, etc.) | One-dimensional | Reduces manual work and improves accuracy, especially for staff. |
| Personalized scheduling for users (e.g., students, staff) | One-dimensional | Supports time management and convenience, especially for students. |
| Priority reminders and alerts based on user context | One-dimensional | Timely alerts help users stay organized and prevent missed events. |
| Indoor navigation inside complex buildings | Attractive | Unexpected but valued feature, especially in large or complex buildings. |
| AR/voice-assisted guidance | Attractive | Adds innovation and convenience, boosting user interest and engagement. |
| Customizable notification filters (urgency, type, etc.) | Attractive | Gives users control, reduces fatigue, praised during prototype testing. |
| Smart suggestions: “You have 15 mins before your next event nearby” | Attractive | Provides helpful nudges, felt intuitive and smart by users. |
| General campus news unrelated to navigation/events | Indifferent | Perceived as low-value; did not aid task completion. |
| Basic reporting tools (unless directly tied to navigation problems) | Indifferent | Not highly regarded unless solving specific navigation issues. |
| Too many or irrelevant notifications (alert fatigue) | Reverse | Unfiltered notifications overwhelmed users; need user control options. |
| Invasive tracking without clear consent | Reverse | Privacy-sensitive users disliked unconsented tracking features. |
| Overcomplicated setup just to access maps/events | Reverse | Setup complexity discouraged users from engaging with the app. |

*Table 3.1: Categorized User Requirements Based on Kano Model Analysis*

## 

## **References**

[1] N. Kano, N. Seraku, F. Takahashi, and S. Tsuji, “Attractive quality and must-be quality,” Journal of the Japanese Society for Quality Control, vol. 14, no. 2, pp. 39–48, 1984.

[2] IEEE Std 29148-2018, Systems and software engineering — Life cycle processes — Requirements engineering, IEEE Standards Association, 2018.

[3] Google Forms, Google Forms Online Survey Tool. [Online]. Available:<https://forms.google.com>. [Accessed: May 18, 2025].

[4] Figma, Figma Design and Prototyping Tool. [Online]. Available:<https://figma.com>. [Accessed: May 15, 2025].

[5] Personal Data Protection Act (PDPA) 2010, Malaysia. [Online]. Available:<https://www.pdp.gov.my>. [Accessed: May 2025].

[6] General Data Protection Regulation (GDPR), European Union, 2016. [Online]. Available:<https://gdpr.eu>. [Accessed: May 2025].

[7] Interviews and prototyping feedback sessions with MMU academic and administrative staff, May 2025, personal communications.

## 