TRIMESTER March/April, 2025



**TRIMESTER March/April, 2025**

**CSE6224 Software Requirements Engineering**

**PROJECT 1**

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

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# **Requirement Elicitation Plan**

## **Selected Elicitation Techniques**

* **Interviews:** To gather qualitative insights from stakeholders regarding their needs and expectations.
* **Surveys/Questionnaires:** To collect quantitative data from a larger user base efficiently.
* **Prototype:** To provide stakeholders with a tangible system model that helps elicit clearer, more specific requirements through interactive demonstrations and hands-on feedback.

**Rationale**

The combination of these techniques ensures comprehensive coverage, capturing both qualitative and quantitative aspects of stakeholder needs. Prototyping facilitates early validation and refinement of requirements by allowing stakeholders to interact with a preliminary system model, thus uncovering implicit requirements and improving communication between developers and users.

## **Tool Used**

* **Survey Platforms (Google Forms):** For distributing questionnaires and collecting responses.
* **Meeting Platforms (Zoom, Microsoft Teams, In-person):** For conducting interviews and workshops.
* **Documentation Tools (Microsoft Word, Google Docs):** For note-taking and report generation.
* **Recording Devices:** To record interviews and ensure accurate transcription.
* **Data Analysis Tools (Excel):** For categorizing and analyzing the gathered data.
* **Prototyping Tool (Figma):** To design interactive prototypes that facilitate early feedback and requirements validation.

# **Elicitation Execution and Findings**

## **Summary of Elicitation Sessions**

### Interview

#### **Interview 1**

<https://youtu.be/lu-GJ7AzxpM>

**Session Type:** Interview

**Date:** 21/05/2025

**Participants:** Dr. Lim Tek Yong (MMU Academic Staff), Wang Kuang Wei (Interviewer)

**Key Findings**

* Dr. Lim highlighted that an automated system syncing with the university database would help organize his daily academic tasks more efficiently, especially for managing postgraduate courses with online submissions and recordings.
* Manual data tracking is tedious and prone to errors; automation is expected to reduce this burden.
* Real-time updates on maintenance and event status would prevent venue booking conflicts, a common issue in managing multiple meetings and visitors.
* Timely and prioritized notifications are essential, distinguishing urgent alerts from general information. Repeated reminders can increase student compliance with deadlines.
* Accuracy is paramount; syncing with the university database is critical, while other features like manual updates and reporting tools are less important to him.
* Dr. Lim expressed moderate openness to adopting the system, noting its usefulness for newcomers but less so for users familiar with campus.
* Concerns include potential misuse of automated tracking and the need for ethical safeguards.
* Recommended notification frequency includes customizable preferences, with some users preferring immediate alerts and others daily summaries.

**Challenges Faced**

* Manual processes currently require meticulous double-checking to avoid errors, which is time-consuming, especially in grading assignments.
* Potential resistance from users who are familiar with the campus and may see limited value in the system.
* Ethical concerns regarding privacy and misuse of location or activity tracking.

**Recommendations**

* Prioritize development of automated syncing with the university database to improve data accuracy and reduce manual workload.
* Implement real-time updates for maintenance and event status to minimize scheduling conflicts.
* Design a notification system that allows users to customize alert types and frequencies, with clear prioritization for urgent messages.
* Incorporate privacy protections and transparent policies to address ethical concerns regarding tracking.
* Consider targeted adoption strategies emphasizing benefits for new users and occasional visitors to maximize system acceptance.

#### **Interview 2**

<https://youtu.be/rnUYXN9xWJ0>

**Session Type:** Interview

**Date:** 20/05/2025

**Participants:** Idraqi (MMU Staff), Chia Kok Ang (Interviewer)

**Key Findings**

* Idraqi emphasized that automated syncing with the university database would greatly reduce his workload and ensure that information remains current.
* Manual data entry was described as time-consuming and prone to inaccuracies, especially due to the need to cross-check information from multiple sources.
* Real-time updates on maintenance and event status were seen as beneficial for improving task efficiency and better communication.
* Lack of real-time updates causes delays and increases misinformation risk.
* Automatic notifications to students are highly valued for improving student awareness and reducing the need for manual reminders.
* Dissatisfaction arises if notifications are not sent automatically, due to inefficiency in manual accommodation.
* Ranking of feature importance by Idraqi prioritized manual update options and reporting tools over automated syncing and real-time updates, possibly reflecting his immediate operational responsibilities.
* The most time-consuming parts of his work involve manual data entry, coordination of event changes, and disseminating updates to students.
* Idraqi acknowledges that adopting an automated system improves efficiency and ensures information is properly received.
* Concerns include system accuracy, reliability, platform integration, and potential resistance to change among staff.
* Essential notifications for students include schedule changes and event reminders.
* To avoid notification fatigue, Idraqi suggests using daily summaries as a notification frequency option.

**Challenges Faced**

* The manual process of data entry and cross-checking information is laborious and risks outdated or inaccurate data.
* Integration with existing systems and ensuring reliable data accuracy are key challenges for implementing new automation.
* Staff resistance to adopting new technology could hinder smooth transition.

**Recommendations**

* Develop an automated syncing system with strong accuracy and reliability to minimize manual workload and errors.
* Implement real-time updates for maintenance and event changes to support efficient communication and scheduling.
* Design an automated notification system with configurable options, including daily summaries to prevent notification overload.
* Plan for change management and staff training to address potential resistance.
* Include robust reporting tools to help quickly identify and correct inaccurate information.

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#### **Interview 3**

<https://youtu.be/cQC6Bg-hm6s>

**Session Type:** Interview

**Date:** 20/05/2025

**Participants:** Ms. Dayang Noorhayati Razid (MMU Staff), Hong Chia Qian (Interviewer)

**Key Findings**

* Ms. Dayang considers automated syncing with the university database to be somewhat helpful and values it as an important enhancement to her workflow.
* Manual input is manageable but less efficient compared to automation.
* Real-time updates on maintenance tickets and event changes are seen as critical to improving task efficiency.
* The absence of real-time updates somewhat limits the ability to manage information effectively.
* Automatic notifications to students about news, class schedules, and events are highly valued; lack of such notifications would lead to dissatisfaction and increased complaints.
* Ms. Dayang rated all key features (automated syncing, real-time updates, automatic notifications, manual update options, and reporting tools) equally as most important.
* The current process for updating information is time-consuming and prone to errors.
* She is very open to adopting an automated system, anticipating it would make her work easier.
* Concerns include system reliability, data accuracy, and how well students will adapt to a new system.
* Essential notifications for students include schedule changes and emergency alerts.
* Notification frequency should be context-dependent, with real-time alerts reserved for urgent matters.

**Challenges Faced**

* The manual updating process is time-consuming and can be error-prone.
* Ensuring system reliability and data accuracy poses a challenge.
* There may be resistance or difficulties related to student adaptation and awareness of the new system.

**Recommendations**

* Prioritize the development of a reliable automated syncing system that integrates seamlessly with the university database.
* Implement real-time updates for maintenance and event information to support staff efficiency.
* Design an automated notification system that delivers prioritized alerts, especially for urgent matters such as emergencies and schedule changes.
* Include manual update options and reporting tools as complementary features to maintain data quality.
* Develop student onboarding or awareness programs to facilitate adaptation to the new system.

#### **Interview 4**

<https://youtu.be/2P0pnZ2tCvY>

**Session Type:** Interview

**Date:** 20/05/2025

**Participants:** Syafrina (MMU Staff), Wang Kuang Wei (Interviewer)

**Key Findings**

* Syafrina expressed that automated syncing with the university database would be very helpful and could reduce the administrative workload.
* Manual input requirements were acknowledged as having a negative impact on work efficiency.
* Real-time updates on maintenance status and event changes provide timely information that facilitates communication and task management.
* Without real-time updates, Syafrina’s ability to manage information is somewhat limited.
* Automatic notifications to students regarding news, class schedules, and events are highly valued; they help reduce direct inquiries from students and support administrative tasks.
* The absence of automatic notifications would negatively affect her work and cause dissatisfaction with the system.

**Challenges Faced**

* The current lack of automated syncing and real-time updates complicates communication and increases administrative workload.
* The absence of timely notifications leads to increased inquiries from students, adding to the administrative burden.

**Recommendations**

* Implement automated syncing with the university database to reduce manual workload and improve information accuracy.
* Develop real-time update features for maintenance and event status to support efficient communication.
* Integrate an automatic notification system for students to disseminate important updates and reduce administrative queries.
* Ensure reliability of the system to gain staff trust and reduce dissatisfaction.

### 

### Survey

**Session Type:** Survey

**Date:** 14/05/2025 - 18/05/2025

**Participants:** MMU students (22 participants)

**Key Findings**

* Students frequently face navigation difficulties on campus, primarily due to construction, poor signage, and lack of up-to-date information.
* There is strong interest in a navigation app offering real-time route guidance, event integration, maintenance notifications, and facility details.
* Students prioritize features such as facility availability, class schedule integration, and event updates.
* Notifications about schedule changes, event updates, and facility issues are highly desired to improve campus experience and planning.
* Students expect to use these features daily and report that such functionalities would significantly increase their satisfaction with campus navigation.

**Challenges Faced**

* Navigation problems caused by dynamic campus conditions like construction and maintenance.
* Inadequate or unclear signage complicating wayfinding.
* Lack of real-time information leading to confusion and inconvenience.
* Potential risk of outdated or inaccurate data if manual updates are relied upon.

**Recommendations**

* Develop a campus navigation app with real-time accessible routing and indoor navigation support.
* Integrate event schedules and maintenance alerts within the app for comprehensive information delivery.
* Implement an automated notification system to inform students promptly about schedule changes, event updates, and facility status.
* Ensure continuous updating and accuracy of facility and campus data to maintain user trust and system reliability.
* Provide user options to customize notifications to balance timely alerts and avoid overload.

### Prototyping

**Session Type:** Prototyping

**Date:** 15/05/2025

**Participants:** MMU students

**Key Findings**

* Participants confirmed the critical importance of real-time updates and automatic syncing to reduce manual workload and improve information accuracy.
* The notification customization feature was highly appreciated as a means to prevent alert fatigue.
* Some users found the event and maintenance update interface less intuitive and suggested simplifying navigation or adding filtering options.
* Concerns about system reliability and data accuracy were expressed, indicating the need for robust backend integration.
* Users requested the inclusion of reporting tools for inaccurate data directly accessible from the prototype interface.

**Challenges Faced**

* Prototype data was limited in scope, which affected user confidence in the system’s reliability.
* Some participants needed additional guidance to fully explore configurable notification options.

**Recommendations**

* Enhance prototype interface usability by simplifying event and maintenance update views and adding filtering capabilities.
* Strengthen backend syncing mechanisms to ensure data accuracy and reliability.
* Expand notification preferences to allow fine-tuning by user role and urgency.
* Develop integrated reporting tools within the system to handle inaccurate or outdated information efficiently.
* Plan additional prototyping sessions with broader user groups and improved datasets to validate changes.

## **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.

## **Observations and Notes**

### Observations

Based on comprehensive interviews with MMU staff, surveys from students, and hands-on feedback from the prototyping session, several key observations emerged regarding current challenges and expectations around campus navigation and information management:

* **Positive Reception Towards Automation**Staff consistently expressed strong support for implementing automated systems to manage schedules, facility information, and campus navigation. The prototyping session reinforced this attitude, as participants noted that automation significantly reduced their workload and improved task efficiency. Many described the prototype’s real-time updates and automatic syncing features as “very helpful” and essential for streamlining daily operations.
* **Measured Optimism and Concerns**While there was enthusiasm for automation, some staff expressed cautious optimism during the prototyping phase. They emphasized that the system’s usefulness heavily depends on the reliability and completeness of automation. Participants noted that partial or inconsistent automation—such as delayed syncing or inaccurate data—could diminish trust and limit adoption. This highlighted the critical need for a robust, fully integrated backend system.
* **Manual Processes Are Burdensome**The current reliance on manual data entry and communication was universally recognized as time-consuming and prone to errors. Prototyping provided a clear contrast by demonstrating how automation could alleviate these burdens, improve data accuracy, and reduce repetitive administrative tasks, increasing staff confidence in the system’s potential benefits.
* **Need for Balanced Notification Systems**Automated notifications were widely welcomed as an effective method to keep students informed about schedule changes, events, and emergencies. The prototyping feedback underscored the importance of allowing users to customize notification frequency and types to avoid alert fatigue. Both staff and students recommended dynamic notification controls as a critical usability feature to balance timely communication with user preferences.
* **Varied Staff Roles and Needs**The diverse responsibilities across staff roles—from scheduling and maintenance coordination to direct student communication—imply the system must be flexible and adaptable. The prototype’s ability to offer role-based customization and personalized interfaces was positively received, validating the need for configurable workflows to support different operational contexts.
* **Dynamic and Challenging Campus Environment:**Students highlighted significant navigation challenges stemming from ongoing construction, maintenance, and inadequate signage. Prototyping real-time routing and event integration features was crucial in addressing these concerns, with participants valuing adaptive routing and instant updates that respond to campus changes, improving wayfinding and reducing frustration.

### Additional Notes

* **Strong Agreement on Priority Features**All staff unanimously agreed that automated synchronization with the university database and real-time updates are the system’s most critical features. These functions are fundamental to ensuring information accuracy and operational efficiency.
* **Readiness to Adopt Technology Despite Challenges**Prototyping helped alleviate skepticism and increased openness toward technology adoption. Despite concerns around system reliability and adaptation efforts, staff expressed a positive outlook on transitioning to an automated solution once proven dependable.
* **Privacy and Ethical Considerations**Several staff raised important ethical considerations related to data privacy, particularly concerning tracking technologies embedded in the system. Prototyping discussions made it clear that transparent data handling policies and opt-in consent mechanisms must be integral to the design to build user trust.
* **Interest in Personal Scheduling Tools**Beyond basic navigation and notifications, some staff showed interest in expanded personal scheduling features, such as prioritized task reminders and calendar integrations, suggesting opportunities for future system enhancements.
* **Students’ Desire for Proactive Communication**Students demonstrated a strong desire not only for effective navigational support but also for proactive, timely notifications about events and facility status. The prototype’s notification customization capabilities were particularly well received, indicating a preference for a connected and responsive campus experience.
* **Importance of Managing Notification Load**Both staff and students emphasized the need for finely tuned notification controls. Managing the quantity and relevance of alerts is essential to prevent user overwhelm while maintaining effective and actionable communication.

# **Appendices**

## **Raw Notes or Transcripts**

Include the raw data collected during interviews, workshop notes, and any recorded transcripts.

| **Interview 1:**  <https://youtu.be/fD20E_jqTX8>  Kuang Wei: Good afternoon, Sir. I'd like to conduct an interview to get your feedback on a system we are planning to implement at MMU.  Kuang Wei: My first question is: If the system automatically syncs with the university's database to update schedules and facility information, how would this affect your work?  Dr. Lim (MMU Staff): Based on your question, what I understand is that you're building a new system that integrates scheduling and facilities, right? If so, I would say it would help me organize my daily work better.  Normally, I don't have classes during office hours, but I do assign a master's course after office hours. So for me, the arrangement will require informing students about online submissions, databases, and video recordings.  It would be great if your system could include all of this.  Kuang Wei: If the system does not automatically sync with the university's database and requires manual input, how would that affect your work?  Dr. Lim (MMU Staff): In that case, I would have to do a lot of tracking manually — compiling data and creating my own scheduling or tracking system. I’ve done the necessary preparation before, but it’s quite tedious.  Kuang Wei: If the system provides real-time updates on maintenance status and event changes, how would that impact your tasks?  Dr. Lim (MMU Staff): That would be very helpful. For example, if a venue is selected for an event or meeting and someone else also books it at the same time, it could cause a clash.  In my position, we often receive visitors for different meetings. Sometimes we host two or three groups in one day, each for different purposes, and we may face a shortage of available venues.  So having real-time updates would help us know which room is available and suitable for the number of visitors, making it less tedious to manage.  Kuang Wei: If the system does not provide real-time updates, how would that affect your ability to manage information?  Dr. Lim (MMU Staff): That depends on the timeframe you're referring to. Are the updates happening every second, every minute, or hourly?  If a change is made, it needs to be updated quickly, but users also need a reasonable window to accept the changes.  Currently, one person may make a decision and others just have to accept it — with no negotiation or warning.  This could result in issues, especially if venue bookings are already fixed for the entire semester. Sudden changes could disrupt everything.  Kuang Wei: If the system sends automatic notifications to students regarding news, class schedules, and events, how would you feel?  Dr. Lim (MMU Staff): That would be good, but the notifications should be prioritized. Not every piece of news requires immediate attention. Some messages are urgent; others are just for information. The system should be able to distinguish and prioritize.  Kuang Wei: If the system does not send automatic notifications to students, how would you feel?  Dr. Lim (MMU Staff): In my experience, even when students receive notifications, some still ignore them. A constant reminder system would be more effective — students are more likely to take action if they receive repeated reminders.  Kuang Wei: Now I’d like you to rank the following features from 1 to 5, with 5 being most important and 1 being least important:  Automated syncing with university database  Real-time maintenance and event status updates  Automatic notifications to students  Manual update options  Reporting tools for inaccurate information  Dr. Lim (MMU Staff):  Accuracy — Very important.  Syncing with the university database — Second most important.  The rest — Not as important in my opinion.  Kuang Wei: What are the most time-consuming or error-prone parts of your current information update process?  Dr. Lim (MMU Staff): When the process is handled by one person with a short timeline, errors are more likely.  Currently, marking assignments is very time-consuming. I need to be very careful, double-check everything, and make sure the marks I give are accurate before releasing them.  Kuang Wei: How open are you to adopting an automated system for managing campus navigation and facility information?  Dr. Lim (MMU Staff): It would be useful for first-time visitors to the campus. But for people who are already familiar with the campus, I don’t think it’s necessary.  So I’d say I’m somewhat open to it — it depends on the user.  Kuang Wei: What concerns or challenges do you foresee if a new automated system were implemented?  Dr. Lim (MMU Staff): One concern is the misuse of automation — for example, tracking individuals’ whereabouts without consent. If the system is used to monitor people strictly based on timelines, it could be misused or even politicized.  Kuang Wei: Which types of notifications do you consider essential for students? (e.g., emergency alerts, event reminders, maintenance alerts, schedule changes, general news updates)  Dr. Lim (MMU Staff): For me as an academic staff, I don’t think all of these are necessary for us.  But for students, reminders are very important. Even when deadlines are near or passed, some students don’t take action unless reminded. So a notification system that acts more like a reminder would help them.  Kuang Wei: Finally, how frequently should students receive notifications without feeling overwhelmed? Should it be immediate, daily summary, weekly summary, or only for urgent matters?  Dr. Lim (MMU Staff): If you're asking about me personally, I’d prefer a daily summary. But for students, you should gather feedback from them directly, as each one may have different preferences.  Ideally, the system should allow users to customize their notification preferences — whether they want immediate alerts or summaries. Some things are urgent, others are just for reference.  Kuang Wei: Thank you so much for your time and valuable feedback.  Dr. Lim (MMU Staff): You’re welcome. |
| --- |
| **Interview 2:**  <https://youtu.be/rnUYXN9xWJ0>  Kok Ang:If the system automatically syncs with the university data, updates schedules and facility information, how would this affect your work?  Idraqi (MMU Staff):I guess it's very helpful because it will reduce my workload and everything.Also ensure up-to-date information.  Kok Ang:If the system does not automatically sync with the university's database and requires manual input, how would this affect your work?  Idraqi (MMU Staff):I guess it's very informative because you know that it will increase my workload so it will make a risk of outdated information.  Kok Ang:So if the system provides real-time updates on maintenance status and event changes, how would that impact your task?  Idraqi (MMU Staff):I guess it will greatly improve efficiency.Then being full helps manage for the vector communications.  Kok Ang:If the system does not provide real-time updates, how would that affect your ability to manage information?  Idraqi (MMU Staff):I guess it will give some inability, some delay for my work, also cause misinformation and will increase the risk.  Kok Ang:So if the system sends automatic notifications to students about news, class schedules and events, how would you feel?  Idraqi (MMU Staff):I guess I will be very satisfied with that.Also, it will improve student awareness and reduce the need for reminders.  Kok Ang:So if the system does not send automatic notifications to students, how would you feel?  Idraqi (MMU Staff):I guess I would be very dissatisfied because manual accommodation is inefficient.  Kok Ang:So let's rank the following features according to their importance for you.The first one is the options, #1 is automated syncing with university database, #2 is Real-time maintenance and event status updates , #3 is Automatic notifications to students ,#4 is Manual update options and #5 is Reporting tools for inaccurate information.  Idraqi (MMU Staff):  Manual update options  Reporting tools  Automatic notifications  Real-time updates  Automated syncing  Kok Ang:What are the most time-consuming or problematic parts of your current information update process?  Idraqi (MMU Staff):I guess for my work, it’s manual data entry.Also, I need to do some cross-checking info with multiple sources, coordinating event changes, and sending all the updates to the students.  Kok Ang:How often are you adopting an automated system for managing campus medication and passing information?  Idraqi (MMU Staff):Can we be open?I can say it improves efficiency and ensures proper receipt.  Kok Ang:So what concerns or challenges do you foresee if a new automated system were implemented?  Idraqi (MMU Staff):I guess the concerns are accuracy, reliability, integration with existing platforms, and resistance to change among the staff.  Kok Ang:So which types of notifications do you consider essential for students?  Idraqi (MMU Staff):I guess one of them is easy access to schedule changes and event reminders.  Kok Ang:So how frequently should students receive notifications?  Idraqi (MMU Staff):Well, I guess a daily summary, or we can make this to avoid notification fatigue. |
| **Interview 3**  <https://youtu.be/cQC6Bg-hm6s>  Chia Qian: Hello, I'm going to ask you a few questions for the interview.  Chia Qian: If the system automatically syncs with the university database to  update schedules and facility information, how would this affect your work?  Dayang (MMU Staff): I would say somewhat helpful. If it is an enhancement to the system, I would say somewhat helpful.  Chia Qian: If the system does not automatically sync with the university database and requires manual input, how would this affect your work?  Dayang (MMU Staff): I would say somewhat manageable. Yep, somewhat manageable.  Chia Qian: If the system provides real-time updates on maintenance tickets  and event changes, how would that impact your tasks?  Dayang (MMU Staff): It would really improve efficiency.  Chia Qian: If the system does not provide real-time updates, how would that affect your ability to manage information?  Dayang (MMU Staff): I won’t say severely, but it would somewhat limit the ability.  Chia Qian: If the system sends automatic notifications to students about news, class schedules, and events, how would you feel?  Dayang (MMU Staff): Very satisfied.  Chia Qian: If the system does not send automatic notifications to students, how would you feel?  Dayang (MMU Staff): I would be dissatisfied because students will start complaining.  Chia Qian: Please rank the following features according to their importance in your daily tasks. 5 is the most important and 1 is the least important.   * Automated syncing with university database (5) * Real-time maintenance and event status updates(5) * Automatic notifications(5) * Manual update options(5) * Reporting tools for inaccurate information(5)   Dayang (MMU Staff): All of those are #5 — most important.  Chia Qian: What are the most time-consuming or error-prone parts of your current information update process?  Dayang (MMU Staff): Time-consuming.  Chia Qian: How open are you to adopting an automated system for managing campus navigation and facilities information?  Dayang (MMU Staff): Very open. It would make my life easier.  Chia Qian: Are there any concerns or challenges you foresee if a new automated system were implemented?  Dayang (MMU Staff): I would say system reliability overall — the syncing system, the data itself, and student awareness. How well students adapt to the new system is also a concern.  Chia Qian: Which types of notifications do you consider essential for students?  Dayang (MMU Staff): Related to my job — schedule changes and emergency alerts.  Chia Qian: How frequently should students receive notifications without being overwhelmed?  Dayang (MMU Staff): It depends on the situation. Real-time for urgent matters is best.  Chia Qian: Thank you so much.  Dayang (MMU Staff): Thank you. |
| **Interview 4**  <https://youtu.be/2P0pnZ2tCvY>  Kuang Wei: If the system automatically syncs with the university's database to update schedules and facility information, how would this affect your work?  Syafrina: Yes, very helpful. It can help our job and reduce our workload.  Kuang Wei: If the system does not automatically sync with the university's database and requires manual input, how would it affect your work?  Syafrina: Yes, it will affect my work.  Kuang Wei: If the system provides real-time updates on maintenance status and event changes, how would that impact your task?  Syafrina: It provides timely information to help manage communication.  Kuang Wei: If the system does not provide real-time updates, how would that affect your ability to manage information?  Syafrina: It would somewhat limit my ability.  Kuang Wei: If the system sends automatic notifications to students about news, class schedules, and events, how would you feel?  Syafrina: Very satisfied. Students can know about the data and notifications. Otherwise, students might come to the admin to ask about their schedules, so notifications are very important and a great function.  Kuang Wei: If the system does not send automatic notifications to students, how would you feel?  Syafrina: It won’t help with our job and will interfere with it, causing dissatisfaction towards the system. |

## **Survey Results or Interview Template**

### Survey Template

**Link :** [**Google Form**](https://docs.google.com/forms/d/10H5FHeguTSymA4rmfrUBZVWKelPbwJZ9VVVPUu07gHk/edit)

**Questions :**

1. Are you currently a student, lecturer, or visitor at MMU Cyberjaya?
2. How often do you experience difficulty finding accessible or navigable routes on campus?
3. How often do you face difficulties navigating the campus?
4. What is the most challenging aspect of finding accessible routes on campus?
5. Which feature would be most useful to you? (Select all that apply)
6. Would you prefer receiving automatic notifications about accessibility issues? (e.g., elevator breakdown, blocked pathways due to events)
7. Which facilities would you like to see included on the navigation map? (Select all that apply)
8. How important is it to have event information integrated into the navigation system?
9. What kind of notifications would you find most helpful? (Select all that apply)
10. How would you rate your overall interest in using a campus navigation app?
11. Please share any additional features or improvements you would like to see in the campus navigation system.
12. Please rank the following features based on how important they are to you (5 = Most Important, 1 = Least Important) [Real-time navigation and accessible routes]
13. Please rank the following features based on how important they are to you (5 = Most Important, 1 = Least Important) [Event updates and calendar integration]
14. Please rank the following features based on how important they are to you (5 = Most Important, 1 = Least Important) [Facility availability (e.g., parking, elevators)]
15. Please rank the following features based on how important they are to you (5 = Most Important, 1 = Least Important) [Class schedule integration]
16. Please rank the following features based on how important they are to you (5 = Most Important, 1 = Least Important) [Latest news and announcements]
17. How often would you use the following features? (Select one for each) [Real-time navigation and route planning]
18. How often would you use the following features? (Select one for each) [Event updates and notifications]
19. How often would you use the following features? (Select one for each) [Viewing class schedules]
20. How often would you use the following features? (Select one for each) [Facility availability (e.g., parking, elevator status)]
21. How often would you use the following features? (Select one for each) [Latest news updates]
22. What do you find most challenging when navigating the campus? (Select all that apply)
23. Imagine the following features are available in the app. How satisfied would you be if each feature worked as expected? [Real-time accessible route planning]
24. Imagine the following features are available in the app. How satisfied would you be if each feature worked as expected? [Automated event updates integrated into navigation]
25. Imagine the following features are available in the app. How satisfied would you be if each feature worked as expected? [Real-time parking availability]
26. Imagine the following features are available in the app. How satisfied would you be if each feature worked as expected? [Push notifications for schedule changes]
27. Imagine the following features are available in the app. How satisfied would you be if each feature worked as expected? [Interactive campus map with facility details]
28. Which type of notifications would you like to receive? (Select all that apply)
29. If the campus navigation system provides detailed accessible routes, how would you feel?
30. If the campus navigation system does not provide detailed accessible routes, how would you feel?
31. If the navigation system integrates campus event information, how would you feel?
32. If the navigation system does not integrate campus event information, how would you feel?
33. If the navigation map includes important facilities (like elevators, parking areas, accessible toilets), how would you feel?
34. If the navigation map does not include important facilities (like elevators, parking areas, accessible toilets), how would you feel?
35. If the navigation system shows real-time parking availability, how would you feel?
36. If the navigation system does not show real-time parking availability, how would you feel?
37. If the system provides notifications about any news, class schedules, or campus events, how would you feel?
38. If the system does not provide notifications about any news, class schedules, or campus events, how would you feel?

### Survey Result

The survey was conducted among MMU Cyberjaya students and collected comprehensive feedback regarding their campus navigation challenges and preferences for a navigation application. All respondents identified themselves as students. The majority frequently experience difficulties navigating the campus, primarily due to ongoing construction, inadequate signage, and outdated or insufficient information. Participants expressed strong interest in a navigation system featuring real-time accessible routes, integrated event scheduling, and notifications concerning maintenance and facility availability. Essential facilities desired on the navigation map include elevators, parking spaces, study rooms, and accessible restrooms. Automatic notifications related to class schedule changes, event updates, and emergency alerts were also highly prioritized. Feature importance rankings revealed that facility availability and class schedule integration were deemed most critical, with many respondents expecting to utilize these functionalities on a daily basis. Overall, there was a high level of anticipated satisfaction with a system providing real-time navigation, event updates, parking status, and push notifications; conversely, absence of these features was expected to lead to dissatisfaction. This dataset confirms a substantial need for a reliable and dynamic campus navigation solution that improves accessibility and delivers timely information to users.

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### Interview Template

* + - 1. **Questions**

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4. What is the most challenging aspect of finding accessible routes on campus?
5. Which feature would be most useful to you?
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7. Which facilities would you like to see included on the navigation map?
8. How important is it to have event information integrated into the navigation system?
9. What kind of notifications would you find most helpful?
10. How would you rate your overall interest in using a campus navigation app?
11. Please share any additional features or improvements you would like to see in the campus navigation system.
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14. Please rank the following features based on how important they are to you (5 = Most Important, 1 = Least Important) [Facility availability (e.g., parking, elevators)]
15. Please rank the following features based on how important they are to you (5 = Most Important, 1 = Least Important) [Class schedule integration]
16. Please rank the following features based on how important they are to you (5 = Most Important, 1 = Least Important) [Latest news and announcements]
17. How often would you use the following features? [Real-time navigation and route planning]
18. How often would you use the following features? [Event updates and notifications]
19. How often would you use the following features? [Viewing class schedules]
20. How often would you use the following features? [Facility availability (e.g., parking, elevator status)]
21. How often would you use the following features? [Latest news updates]
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36. If the navigation system does not show real-time parking availability, how would you feel?
37. If the system provides notifications about any news, class schedules, or campus events, how would you feel?
38. If the system does not provide notifications about any news, class schedules, or campus events, how would you feel?

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## **Prototype**

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## **References**

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

[2] Google Maps Platform, *Google Maps API Documentation*. [Online]. Available: https://developers.google.com/maps/documentation. [Accessed: May 15, 2025].

[3] Google Forms, *Google Forms Online Survey Tool*. [Online]. Available: [https://forms.google.com](https://forms.gle/HVwtyEFH2FwHaKaq9). [Accessed: May 18, 2025].

[4] Figma, *Figma Design and Prototyping Tool*. [Online]. Available: [https://figma.com](https://www.figma.com/design/ASSktSIs8ZKbx6i9p4nl4b/SRE?node-id=1-2&t=5XKNnyQmCfEHy0SE-1). [Accessed: May 15, 2025].

[5] Zoom Video Communications, Inc., *Zoom Meetings*. [Online]. Available:<https://zoom.us>. [Accessed: May 20, 2025].

[6] Microsoft Teams, *Microsoft Teams Communication Platform*. [Online]. Available:<https://teams.microsoft.com>. [Accessed: May 20, 2025].

[7] Microsoft Excel, *Microsoft Excel Data Analysis Tool*, Version 2021, Microsoft Corporation.

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

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

[10] Interviews with MMU Academic and Administrative Staff, May 2025, personal communications.