

**TRIMESTER March/April, 2025**

**CSE6224 Software Requirements Engineering**

**PROJECT 1**

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

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# **Context Object**

The context objects of the Campus Accessibility Navigation System are essential components that define the system's interactions and data flow. These objects are categorized based on their roles and responsibilities within the system. Below is a detailed breakdown of each context object.

## **Student(End Users)**

### Role/Responsibility

Students are the primary users who require efficient campus navigation. They need access to event schedules, facility updates, and real-time route planning to navigate the campus effectively.

### Interaction with System

Students use the application to:

* Find accessible routes on campus.
* Access event information and class schedules.
* Receive notifications about changes or updates in campus facilities and events.
* Customize their notification preferences to receive only relevant updates.

## **MMU Staff (Admins)**

### Role/Responsibility

MMU staff, acting as system administrators, are responsible for maintaining data accuracy and updating event information. They manage the input and maintenance of campus navigation data, including event postings and facility statuses.

### Interaction with System

MMU staff interact with the system to:

* Post new events and update existing event information.
* Update facility information such as the operational status of elevators, parking, and accessible toilets.
* Maintain data integrity through the admin panel, ensuring that all updates are correctly reflected in the system.

## 

## **Notification**

### Role/Responsibility

The notification system delivers timely updates and important information to users. This includes class schedules, event updates, facility status changes, and campus news.

### Interaction with System

* + - The system fetches data from the backend, including class schedules, event updates, and news.
    - Notifications are displayed based on user-defined preferences (e.g., receiving only class updates or event changes).
    - Users can filter notifications by type to streamline the information they receive.

## 

## **Facilities**

### Role/Responsibility

Represents physical campus elements such as elevators, parking areas, and accessible toilets. These facilities are critical for accessibility and navigation within the campus.

### Interaction with System

* + - The system provides real-time updates on the operational status of facilities.
    - Displays the availability and accessibility of each facility.
    - Alerts users to any maintenance or downtime that may impact accessibility.

## **Events and Activities**

### Role/Responsibility

Represents campus events, including student club meetings, university-organized activities, and events that might impact accessibility.

### Interaction with System

* + - The system updates event locations and accessibility provisions.
    - Displays potential disruptions to accessibility during events.
    - Integrates with the navigation system to suggest alternative routes when necessary.

## **Navigation System**

### Role/Responsibility

The navigation system is the core feature of the application, offering route planning and real-time updates. It integrates data from various university databases to deliver accurate and accessible routing information.

### Interaction with System

* + - Maps accessible paths considering real-time facility status and event impacts.
    - Offers alternative routes when usual paths are obstructed or unavailable.
    - Provides guidance through interactive maps and route suggestions.

# **Requirement Sources**

## **Primary Sources (Stakeholders)**

### **Students (End Users)**

#### Relevance

Students are the primary users of the Campus Accessibility Navigation System. They require accurate navigation assistance, updates on campus events, and information about facilities. Their feedback is essential for identifying user requirements and preferences, as they directly interact with the system.

#### Data Collection Methods

* + **Questionnaire:** Data was collected through Google Forms, designed to identify challenges faced by students regarding navigation and preferred system features.
  + **Prototype Testing:** Feedback was gathered through usability testing, focusing on evaluating the interface and navigation functionality.

### **MMU Staff (Admins)**

#### Relevance

As system administrators, MMU staff are responsible for maintaining the system's accuracy by managing event postings, updating facility information, and ensuring smooth navigation across the campus. Their input is vital for understanding the system's administrative requirements.

#### Data Collection Methods

* + **Interviews:** Conducted with staff members and lecturers to understand administrative needs and system expectations.
  + **Workflow Analysis:** Studied existing processes related to campus information management to identify areas for integration.

## **Secondary Sources (Documents and Existing Systems)**

### **University Database (Class Schedules and Facility Information)**

#### Relevance

This database holds essential information required for the navigation system, including class timetables, facility availability, and maintenance records. Real-time data integration is crucial for accurate navigation assistance.

#### Data Collection Methods

* + **API Documentation:** Reviewed to understand data integration processes for real-time updates.
  + **System Manuals:** Examined to comprehend data structure and capabilities within the existing system.

### **Campus Event Calendar**

#### Relevance

Contains information on scheduled events that might impact campus accessibility, including construction activities and temporary accommodations.

#### Data Collection Methods

* + **Digital Calendar Access:** Analyzed to assess event details and update frequencies.
  + **Coordination Meetings:** Held with staff to discuss event management and scheduling practices.

## **Tertiary Sources (Observations)**

### **On-Site Observations**

#### Relevance

Direct observation of the campus environment helps identify physical accessibility challenges, such as blocked pathways or facilities under maintenance. This is essential for creating accurate navigation paths.

#### Data Collection Methods

* + **Field Visits:** Inspected key campus areas to document accessibility issues and high-traffic zones.
  + **Problem Mapping:** Noted locations frequently affected by maintenance or construction work.

## **Feedback and Evaluation**

### **Survey Responses**

#### Relevance

Surveys provide quantitative data from students regarding navigation difficulties and preferences for new features. This helps tailor the system to actual user needs.

#### Data Collection Methods

* + **Google Forms:** Designed to capture students’ expectations and highlight problem areas in navigation.

### **Prototype Testing**

#### Relevance

Validates the system features and helps identify potential improvements through direct user interaction.

#### Data Collection Methods

* + **User Testing Sessions:** Conducted to gather insights into the functionality and user experience of the prototype.

## **Pending Data Collection**

### **Interview Results**

Interviews were conducted with MMU administrative staff and lecturers to understand their perspectives on the proposed Campus Accessibility Navigation System, focusing on system integration, data accuracy, notification preferences, and workflow impact.

* **System Synchronization**Staff emphasized that automatic syncing with the university database to update schedules and facility information would significantly reduce their workload and improve data accuracy. Manual input was noted as time-consuming and error-prone. (Dayang, Idraqi, Syafrina, Dr. Lim)
* **Real-Time Updates**Real-time updates on maintenance tickets, event changes, and facility statuses were seen as crucial for efficient management and avoiding scheduling conflicts. Lack of real-time updates limits staff ability to provide timely information. (All interviewees)
* **Notifications to Students**Automatic notifications about class schedules, event changes, and emergency alerts are highly valued. Staff expressed that without automated notifications, both their workload increases and student dissatisfaction rises due to delayed or missing information. (Dayang, Idraqi, Syafrina)
* **Feature Importance Rankings**Interviewees ranked key features consistently high:
  + Automated syncing with university database
  + Real-time maintenance and event status updates
  + Automatic notifications to students
  + Manual update options and reporting tools were considered important but secondary.
* **Concerns and challenges**Concerns raised include system reliability, data accuracy, integration complexity, student adaptation to new systems, and potential misuse of automation for tracking purposes. Notification fatigue was also mentioned, suggesting preference for customizable notification settings.

### **Questionnaire Results**

A survey was conducted via Google Forms among MMU students to gather quantitative data on navigation difficulties, preferred app features, and notification preferences.

* **Navigation Challenges**Many students frequently experience difficulties finding accessible routes on campus, especially due to construction or maintenance, poor signage, and lack of information.
* **Preferred Features**Students prioritize features such as:
  + Event updates and schedule integration
  + Real-time navigation with accessible routes
  + Notifications about maintenance issues
  + Facilities most requested on the map include elevators, parking availability, and study rooms.
* **Notification Preferences**Students prefer automatic notifications related to accessibility issues, maintenance updates, event reminders, route changes, emergency alerts, and class schedule changes.
* **Importance Ratings**Features ranked by importance include:

1. Facility availability (parking, elevators)
2. Class schedule integration
3. Real-time navigation and accessible routes
4. Event updates and calendar integration
5. Latest news and announcements

* **Overall Interest and Satisfaction**There is a high overall interest in using a campus navigation app. Satisfaction is high with automated event updates, real-time parking availability, and push notifications, with neutral to positive satisfaction for accessible route planning and interactive maps.
* **Expected Reactions**

Positive user reactions are expected if the system includes detailed accessible routes, integrated event information, real-time facility updates, and comprehensive notifications. Negative reactions may occur if these features are missing.

# Reference

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

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