

**TRIMESTER March/April, 2025**

**CSE6224 Software Requirements Engineering**

**PROJECT 1**

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

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# **Vision**

## **Purpose**

* To establish a comprehensive navigation solution that addresses accessibility challenges for students and staff across the MMU campus.
* To create a unified platform that integrates real-time facility information, event updates, and personalized navigation assistance.
* To ensure equal access to campus resources and activities for all users regardless of mobility requirements.

## **Elaboration**

### **Vision for the Campus Accessibility Navigation System**

* Providing an intuitive navigation system that not only guides users along optimal routes but also proactively informs them about facility status changes, events, and accessibility considerations.
* Minimizing navigation difficulties and accessibility barriers that often lead to missed classes, events, or inefficient travel across campus.
* Making campus navigation accessible to everyone, thereby promoting better inclusion and equal opportunity for all students to participate in campus life.
* Serving as a bridge between the physical campus environment and digital information systems, ensuring that users have accurate, timely information to make informed decisions about their campus movements.

# **Scope**

## **Coverage**

* The development of a mobile application that provides accessible navigation across the MMU campus for students and staff.
* The definition of essential features, user interactions, and data integration points necessary for effective campus navigation with accessibility considerations.
* The interfaces and interactions with other university systems and databases.

## **Elaboration**

### **System capabilities**

1. **User Interface Elements:**
   1. Mobile application with intuitive navigation controls designed for diverse accessibility needs
   2. Personalized user profiles and preference settings
   3. Accessible interface design compliant with WCAG 2.1 Level AA standards
2. **Core Functionality:**
   1. Real-time campus navigation with accessibility-focused routing
   2. Facility status monitoring (elevators, ramps, parking, accessible toilets) with uptime of at least 99.5%
   3. Event and activity information integration updated within 5 minutes of changes
   4. Personalized notification system with user-defined filters
3. **Data Integration Components:**
   1. Secure connection with university database for class schedules
   2. REST API integration with campus event calendar
   3. Real-time facility status updates through IoT sensors or manual updates
   4. User feedback collection mechanism with structured and free-form input options
4. **Administrative Functions:**
   1. Content management system for MMU staff with role-based access control
   2. Event posting and management with bulk upload capabilities
   3. Facility status update capabilities including scheduled maintenance notifications
   4. User data management and analysis with privacy controls

### **System constraints**

* The system shall operate on iOS 14+ and Android 10+ mobile devices
* The system shall support at least 10,000 concurrent users
* The system shall provide response times under 2 seconds for navigation requests
* The system shall comply with GDPR and local data protection regulations
* The system shall operate within the university's existing IT infrastructure

### **Out of scope**

* Indoor navigation beyond main building entrances and exits
* Integration with external transportation systems
* Building maintenance management functionality
* Classroom scheduling or booking capabilities
* Systems unrelated to campus navigation and accessibility

# **Goals**

## **Objectives**

* To develop a user-friendly mobile application that provides accessible navigation routes across the MMU campus with at least 95% route accuracy.
* To establish a real-time information system for facility status updates that impact accessibility, with updates reflected within 60 seconds.
* To integrate campus events and activities with the navigation system to provide contextual awareness of at least 98% of scheduled events.
* To create a notification system that delivers personalized, relevant updates to users with customizable delivery preferences.
* To provide MMU staff with efficient tools to manage navigation-related information, reducing administrative workload by at least 30%.

## **Elaboration**

### **Enhanced accessibility**

* The system shall provide navigation routes that accommodate users with various mobility requirements.
* The system shall consider real-time facility status, temporary obstructions, and user-specific needs when calculating routes.
* The system shall reduce navigation time for users with accessibility needs by at least 25% compared to current methods.
* The system shall provide alternative routes when primary accessible paths are unavailable.

### **Improved information delivery**

* The system shall deliver notifications about relevant campus changes within 2 minutes of updates.
* The system shall allow users to filter notifications based on at least 5 different categories.
* The system shall provide information in multiple formats (text, visual maps, audio guidance) to accommodate different user needs.
* The system shall achieve a notification relevance rating of at least 4.2/5 in user satisfaction surveys

### **Streamlined administration**

* The system shall provide an administrative interface requiring no more than 30 minutes of training for basic operations.
* The system shall include batch update capabilities for facility status and event information.
* The system shall automate at least 70% of routine information management tasks.
* The system shall provide activity logs and audit trails for all administrative actions.

### **User empowerment**

* The system shall enable users to customize their navigation preferences based on at least 8 different parameters.
* The system shall provide users with estimated travel times accurate within 2 minutes for 90% of routes.
* The system shall allow users to save frequent destinations and routes for quick access.
* The system shall achieve a user satisfaction rating of at least 4.0/5 in usability testing.

### **Data-driven improvements**

* The system shall collect anonymous usage data to identify navigation patterns and challenges.
* The system shall generate monthly reports on facility accessibility issues based on navigation data.
* The system shall provide metrics on event attendance correlated with accessibility factors.
* The system shall incorporate user feedback mechanisms with at least 15% response rate.

# Timeline(Gantt Chart)