

PROJECT ABSTRACT

Campus Navigation App with Building Directory

An Android app (web prototype) for large campuses: searchable building directory, offline vector map with live position, turn-by-turn walking routes with landmarks, and saved places. Delivered built-to-order with the app prototype, report, PPT and viva kit.

01. Title

Campus Navigation App with Building Directory

02. Introduction / Background

First-year students routinely get lost on large campuses: the exam cell is 'in the admin building, second floor', but which building is the admin building, and which of its three entrances? Public map apps know the campus boundary but not its buildings, blocks, labs and hostels. This project builds CampusWay, an Android app purpose-built for one campus: a searchable directory of every building with departments, timings and contacts, an offline vector map that works without mobile data, walking routes with landmark-based instructions, and saved places — the campus knowledge Google Maps does not have.

03. Problem Statement

Generic map apps lack building-level campus data and need internet; newcomers therefore navigate by asking strangers. The project addresses this with a campus-specific app: the directory answers 'what is where', the offline map answers 'where am I', and the router answers 'how do I walk there' — with landmark instructions ('turn left at the fountain circle') that work better on foot than street names.

04. Objectives

- Provide a searchable, category-filtered directory of campus buildings with details and distances.
- Render an offline vector campus map with the user's live GPS position.
- Generate walking routes between any two points with landmark-based turn instructions, distance and time.
- Support saved places and recent searches for one-tap navigation.
- Make tapping a map building open its directory card with a Directions action.
- Deliver the complete student kit: working web prototype of all screens, report, PPT and viva Q&A.;

05. Proposed Methodology

The app is prototyped as an interactive single-file web app mirroring the Android screens. (1) Directory: a building dataset (name, category, description, relative distance) with text search and category chips. (2) Map: an SVG vector campus plan with tappable buildings, a pulsing 'you are here' marker, and offline-map versioning notes. (3) Router: a curated shortest-path walkthrough with numbered landmark steps, distance and time estimates. (4) Saved: starred places plus recent searches. Bottom-tab navigation switches screens; the prototype demonstrates the full flow the native app implements with Android location services and a bundled vector tile pack.

06. System Architecture / Working

In the native design, the campus vector map ships as a bundled tile pack so it renders with zero connectivity; the fused location provider drives the position dot. The directory is a local database queried by text and category. Routing runs on a campus walkway graph (nodes at junctions, edges with distances), and instructions are generated from edge landmarks stored per segment. The prototype reproduces the map, directory, an example route (Main Gate to CSE Block) and saved places with realistic campus data, so every screen is demonstrable end to end.

07. Hardware / Software Requirements

- Android phone (Android 9+) for the native build; the prototype runs in any browser
- Prototype: single HTML/CSS/JS file with inline SVG map (vanilla JavaScript)
- Native build path: Kotlin, Google Maps / MapLibre SDK, fused location provider, Room database
- Report: LibreOffice/MS Word; presentation: PowerPoint-compatible slides

08. Expected Outcomes

- A directory that finds any campus building by name or category with useful details.
- An offline map showing buildings and live position without internet.
- A complete walking route with landmark instructions, distance and time.
- A complete report, PPT and viva Q&A; on mobile mapping, offline tiles and route UX.

09. Applications

- New students, parents and guests navigating large campuses.
- Colleges can re-skin the app with their own campus map and directory.
- Event organizers guiding visitors to venues during fests.

10. Future Scope

- Indoor positioning with BLE beacons for multi-floor buildings.
- Live shuttle/bus tracking overlaid on the campus map.
- Accessibility routing avoiding stairs for wheelchair users.