**FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING
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PROJECT TITLE:

REQUIREMENTS GATHERING REPORT FOR THE DESIGN AND IMPLEMENTATION OF A ROAD SIGN AND ROAD STATE MOBILE NOTIFICATION APPLICATION

GROUP 9

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1. INTRODUCTION:

Requirements gathering is a crucial phase in the software development life cycle. It involves the process of collecting the functional and non-functional requirements from stakeholders to ensure the end product aligns with their needs.

This report outlines the comprehensive requirements gathering process for the implementation of a mobile application designed to enhance road safety and navigation by providing drivers access to road sign information and real-time road condition updates. The application aims to address the challenges of poor road signage visibility, inadequate understanding of road signs, and lack of real-time information about road conditions, ultimately contributing to improved road safety and efficient travel.

2. OBJECTIVES:

-To understand the specifc problems faced by road users in Cameroon.
- To identify the needs and expectations of potential users regarding road sign awareness and road condition updates.
- To determine functional and non-functional requirements of the application.
- To establish the system's scope, features and constraints.

3. STAKEHOLDERS:

Identifying stakeholders is a critical step in requirements gathering. The following stakeholders were identified:

A. **PRIMARY STAKEHOLDERS:**

The key stakeholders involved in this project include:
- **Drivers and Road Users:** Primary users who will benefit from real-time notifications and road sign awareness.
- **Traffic Authorities:** Organizations that manage and regulate road safety and traffic updates.
- **Government Agencies and Transport Ministries:** Can provide data sources for road signs and traffic regulations.

B. **SECONDARY STAKEHOLDERS:**

- **Development Team:** Responsible for designing and implementing the application.
- **Crowdsourced Contributors:** Users who will provide real-time updates about road conditions.

4. REQUIREMENTS GATHERING TECHNIQUES:

Several techniques were used to gather accurate and relevant requirements. These include:

a. **Surveys and Questionnaires:**
  - Distributed to frequent drivers in urban parts(e.g Buea) of Cameroon.
  - Collected data on the most common road issues, mobile usage habits and awareness of road signs.

b. **Interviews:**
  - Conducted with road safety officers and experienced drivers to understand challenges in road sign education and traffic awareness.

c. **Observation:**
  - Noted driver behavior and road conditions on highways.
  - Identified conditions alerts would be helpful.

d. **Review of Existing Systems:**
  - Studied navigation apps like Google Maps to identify gaps in localized road sign information.

e. **Brainstorming Sessions:**
  - Internal team meetings helped identify potential features, challenges and integration strategies.

f. **Focus Groups:**
  - Group discussions with users and stakeholders to brainstorm ideas, features and potential issues.

5. DATA GATHERING:

The data gathered from the above techniques included:

a. **Quantitative Data:**
  - Number of drivers unaware of common road signs.
  - Frequency of encountering road hazards.
  - Preferred notification methods.

b. **Qualitative Data:**
  - User suggestions for app features.
  - Descriptions of recurring road conditions and hazards.
  - Feedback on existing navigation systems' weaknesses.

6. DATA CLEANING:

After initial collection, data underwent cleaning to ensure quality and usability. This was perfomed through the following:

a. **Duplicate Responses Removal:**
  Eliminated repeated survey inputs and interview notes.

b. **Standardization:**
  Normalized terminology for road signs and conditions across all data sets.

c. **Filtering:**
  Discarded irrelevant or incomplete feedback entries e.g vague suggestions with no context.

7. USER RELUCTANCE ASSESSMENT:

User reluctance was a critical factor considered during requirement gathering. The following concerns were identified:

a. **Privacy and Security:**
   This included the reluctance of users to share their location data due to fear of tracking or data misuse.

b. **Data Costs:**
   Users worried about the app consuming too much mobile data.

c. **Complex Interfaces:**
   Older users feared the app would be too technical to use.

d. **Skepticism Towards Crowdsourced Data:**
   Users were concerned that inaccurate reports could lead to mistrust in alerts.

8. MITIGATION STRATEGIES:

- Transparent privacy policy and data-use notifications.
- Offline caching of sign directory to reduce data usage.
- Simple, clean UI/UX design for accessibility.
- Report validation via upvotes or admin review.

9. CONCLUSION:

The requirements gathering phase for the Road Sign and Road State Mobile Notification Application provided a strong foundation for the successful design and implementation of the project. Through careful stakeholder identification and the use of diverse techniques- such as surveys, interviews, and system analysis- cricial insights were obtained that align the application with real user needs and expectations.

The data gathered was systematically cleaned and refined to ensure reliability and user reluctance factors were thoroughly assessed to guide user-centered design decisions. By understanding potential concerns around usability, privacy and trust, the project team is better positioned to develop a functional, user-friendly and impactful mobile application that addresses road safety challenges in Cameroon.

10. REFERENCES:

Google Forms link =
https://docs.google.com/forms/d/e/1FAIpQLSfuG2qbCjj1KeUkpMTDHAWLl oxYMeP8dug4Ca-57tbQKR1NKQ/viewform?usp=dialog