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**DEPARTMENT OF COMPUTER ENGINEERING**

# Requirement Gathering and User Needs Analysis for a Mobile Network Monitoring Application in Cameroon

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# Task 2: Requirement Gathering

## Introduction

In the development lifecycle of any user-centered application, the requirement gathering phase serves as a foundational step that directly influences the success of the final product. This task focuses on systematically collecting and analyzing user needs, preferences, and challenges related to mobile network performance in Cameroon. Given the dynamic and inconsistent nature of network services provided by major telecommunication companies—namely MTN, Orange, and Camtel—there is a growing demand for a mobile application that can help users monitor, report, and navigate their network experiences more effectively.

To address this need, a comprehensive approach was adopted involving stakeholder identification, deployment of diverse requirement gathering techniques such as surveys and interviews, and detailed data analysis. Special emphasis was placed on understanding user behavior, satisfaction levels, and the practical challenges faced when using mobile networks in various regions. This task also explores user sentiment toward a proposed mobile app, identifies key pain points with current network services, and evaluates potential reluctance to app adoption due to privacy or usability concerns.

The insights derived from this requirement gathering process will directly inform the functional and non-functional requirements of the proposed solution, ensuring it is tailored to user expectations and grounded in real-world data.

## Abstract

This report presents a structured approach to requirement gathering for the development of a mobile application aimed at monitoring and reporting mobile network performance in Cameroon. Recognizing persistent issues such as fluctuating signal strength, inconsistent bandwidth, and the need for network switching, this task involved identifying key stakeholders and applying multiple data collection techniques, including surveys, interviews, and qualitative analysis.

A user-centered methodology was adopted to ensure the app reflects real user needs and concerns. Data was gathered from a diverse group of respondents across various cities and analyzed to uncover patterns in network usage, satisfaction, and app feature preferences. The report also addresses user reluctance related to privacy and app usage behavior.

Findings indicate a strong interest in the proposed app, with users expressing a need for features such as real-time signal monitoring, issue reporting, and low data/battery consumption. The results of this task will serve as a critical input for the next phases of application design and development, ensuring that the final product is both practical and aligned with user expectations.

# 1. Stakeholder Identification

To effectively gather and implement the requirements for a mobile app that monitors and reports mobile network experience, it is crucial to identify all stakeholders involved:

**Mobile Network Users**: The primary stakeholders who will use the app to report and monitor their network performance. Their feedback, experiences, and preferences are central to the development of the application.

**Telecommunication Providers (MTN, Orange, Camtel)**: Secondary stakeholders whose service quality is evaluated. They can potentially use this data to improve their network infrastructure and service.

**App Developers and UX Designers**: Responsible for transforming user needs into a working, intuitive mobile application. Their role includes feature development, UI/UX optimization, and maintenance.

**Data Analysts**: Tasked with interpreting collected data to understand user behavior, satisfaction, and network performance trends.

**Project Sponsors/Investors**: Entities that fund the project and are interested in its commercial viability and user adoption.

# 2. Requirement Gathering Techniques

To collect accurate and relevant requirements, the following techniques were used:

## 2.1 Surveys

A structured survey was administered to gather user demographics, network usage patterns, issues encountered, satisfaction levels, and interest in a potential app. The data was collected from 65 respondents across different age groups and cities.

## 2.2 Interviews and Open-Ended Feedback

Though primarily survey-based, a section of the survey allowed for open-ended responses. These qualitative responses provided insights into specific pain points and user suggestions.

## 2.3 Brainstorming

Internal brainstorming sessions were conducted among the research and development team to hypothesize potential features and analyze feasibility based on the feedback collected.

### 2.4 Reverse Engineering

By analyzing existing apps in the network diagnostics space, competitive features and market gaps were identified to ensure a value-added offering.

# 3. Data Gathering

Survey data was collected through an online form(google docs) that included both multiple-choice and open-ended questions. Key aspects covered include:

Age, gender, and location demographics

Mobile network(s) used (MTN, Orange, Camtel)

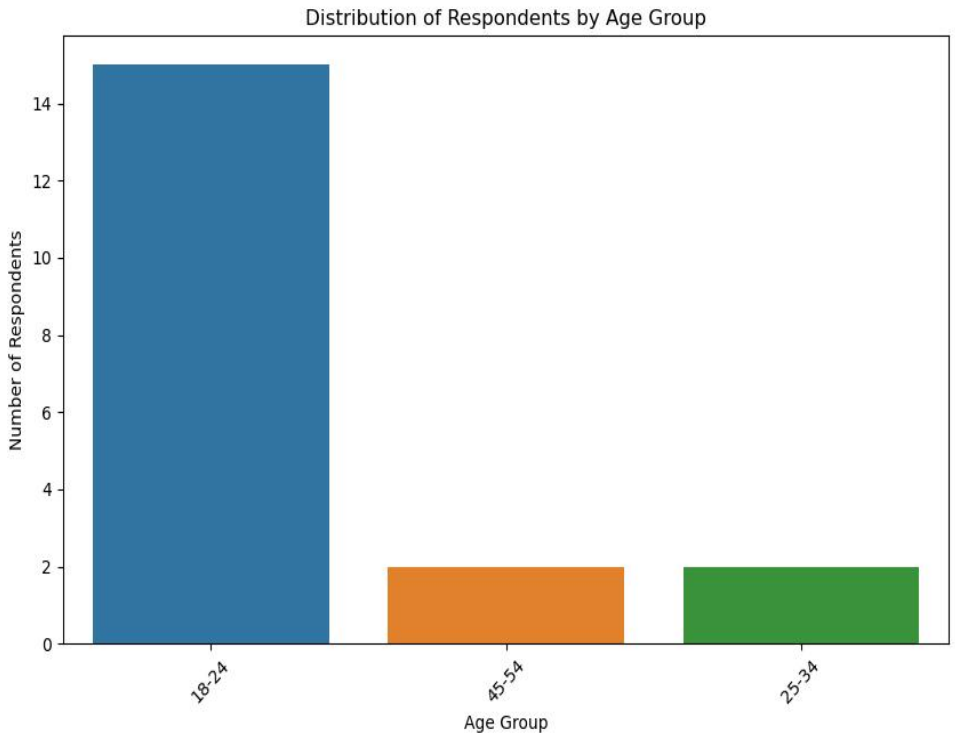
Type of phone and internet connection (mostly 4G)

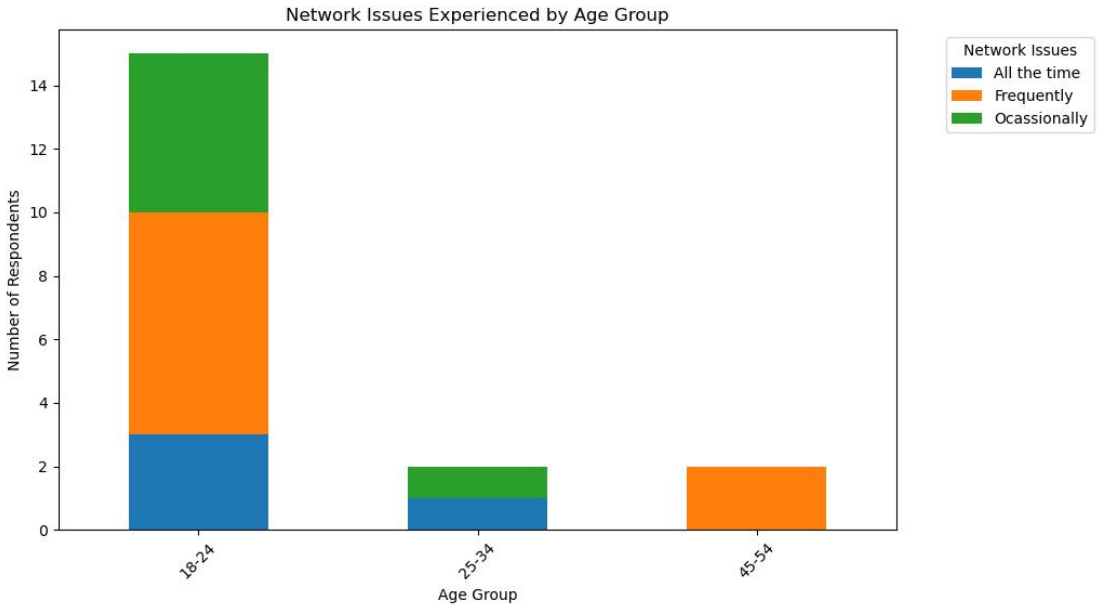
Frequency and type of network issues

Satisfaction with network performance

Interest in using an app for reporting network experience

Desired app features and privacy concerns






**Highlights from the data:**

Majority of respondents use MTN and Orange.

Camtel is used by fewer people and is often described as cheap but unreliable.

Users report frequent network issues, especially fluctuating signal strength, slow internet, and dropped calls.

Orange is considered more stable, though it has weekend disruptions.

MTN is inconsistent and bandwidth-constrained in several regions.

A majority expressed interest in an app to monitor/report network performance.

# 4. Data Cleaning

The raw survey data was cleaned and processed using the following steps:

Removal of incomplete or inconsistent entries.

Standardization of categorical responses (e.g., converting variants of "Camtel" or "MTN" into uniform terms).

Grouping similar open-text answers for qualitative analysis.

Transformation of check-all-that-apply responses into binary indicators for analysis.

This ensured the integrity and consistency of the data before deeper analysis.

# 5. User Reluctance Assessment

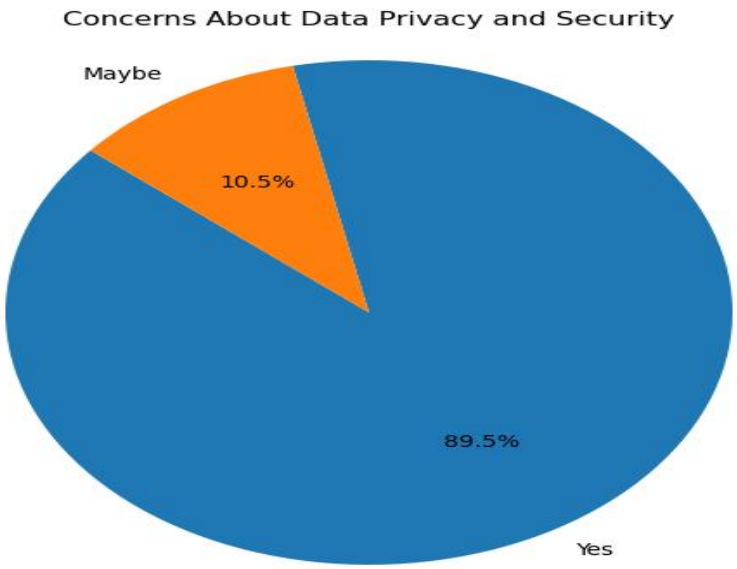
To assess potential user reluctance, we analyzed responses around privacy, feedback frequency, and concerns with the proposed app:

**Privacy Concerns**: A significant number of users are concerned about data privacy. They are willing to share data only if it's anonymous or with permission.

**Feedback Fatigue**: Many users prefer to give feedback only when they encounter issues, rather than on a regular basis.

**Battery/Data Usage**: Some expressed concerns about the app consuming battery and mobile data.

These insights indicate that while there is substantial interest in the app, transparency about data usage and offering opt-in mechanisms will be critical to driving adoption.



# 6. Insights from Frequency Analysis and Qualitative Data

| Observation | Frequency | Summary |
|---|---|---|
| Network strength varies across locations | 2 | Users compared network strengths across different providers and locations. |
| Bandwidth concerns, Camtel slow but cheap, Orange more stable | 5 | Bandwidth is a primary concern. MTN is inconsistent, Camtel cheap but slow, Orange stable. |
| MTN and Camtel fluctuate; bandwidth critical | 4 | Users rely on both networks but experience fluctuating quality. |
| Camtel unusable; Orange better than MTN | 20 | Camtel not dependable. Orange offers better consistency. |
| Network switching common; Orange worse on weekends | 25 | Users frequently switch networks; Orange degrades on weekends. |
| MTN best in some areas; still disturbances daily | 4 | Even the best networks are unreliable across different areas. |

# 7. Survey-Based Conclusions

## General Conclusion

Most users face recurring issues with mobile network reliability, especially fluctuations in signal strength and bandwidth. MTN, though widely used, is inconsistent. Camtel is considered fast but expensive and often unusable. Orange is the most stable but has disruptions, particularly on weekends. Users often switch between networks to find the best performance based on location and time.

## Specific Network-Based Findings

**MTN**: Widely used but suffers from inconsistency and fluctuating signal strength. Users often use it in combination with other networks.

**Camtel**: Seen as cheap but usually slow. Limited trust in its reliability.

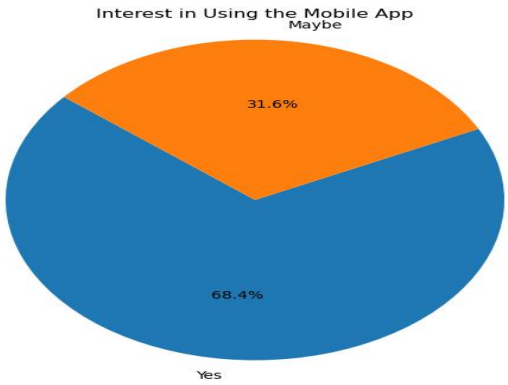
**Orange**: Regarded as the most stable overall. However, weekend service interruptions are a recurring issue.

**Network Switching**: A common user behavior due to inconsistent service across providers and regions.

# 8. Application Interest and Feature Preferences

## Interest in the Mobile App

A majority of users expressed interest in using an app that monitors and reports network performance.




## Demographics

The majority of respondents fall in the 18–34 age range, primarily male, and located in cities like Buea, Yaounde, and Douala.

## Satisfaction Levels

Satisfaction varies by age group, with many younger users showing dissatisfaction, likely due to higher dependency on stable internet for education, work, or entertainment.

## Common Problems Identified

Slow internet speed

Dropped calls

Poor voice quality

Apps/websites not loading

## Feature Requests

Top requested features include:

Manual issue reporting

Signal strength monitoring

Speed test

Network rating

### Privacy Concerns

Users are concerned with data privacy, especially regarding location tracking. Transparent policies and data anonymization are necessary.

# 9. Recommendations

**Targeted Marketing**: Focus outreach on highly affected cities and demographics, especially young adults.

**Feature Development**: Prioritize features like signal strength visualization, issue reporting, and minimal data usage.

**Improve Trust**: Emphasize anonymous data collection and transparency in how data will be used.

**Feedback Options**: Allow flexible feedback mechanisms—event-triggered reporting over fixed schedules.

**User Education**: Inform users how their feedback will lead to real service improvements, possibly with network provider partnerships.

**Network Performance Mapping**: Include a map view that lets users see network performance in real-time across different locations.

# 10. Conclusion

The requirement gathering process, combining survey analysis and user feedback, reveals clear user needs: stable network performance, transparent app features, and strong privacy assurances. By addressing these needs, the proposed mobile app can play a vital role in enhancing the mobile network experience in Cameroon.