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COURSE TITLE: Internet and Mobile Programming

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COURSE INSTRUCTOR: Dr. Nkemeni Valery

TASK 5: UI DESIGN AND IMPLEMENTATION

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Table of Content

Brand Identity Report: Vital Sign

"Real-time Quality of Experience Feedback"

1. Brand Overview

App Name: Vital Sign

Purpose: Enables users to share real-time feedback on their network Quality of Experience (QoE), which is then forwarded to their network providers.

Unique Value: Empowers users to voice their network experience in a structured, data-rich, and real-time format, driving better service accountability.

2. Visual Identity

Table 1: Color Palette

Element	Color (Hex / Opacity)	Description
Background (main panels)	#1C1F2A (Dark Blue Gray)	Professional, calm
Foreground Panels/Fields	#2A2E3D (Slightly lighter)	Clear distinction for sections
Highlight Yellow	#FFD54F / #FFC107	Used for experience rating (e.g., emoji row, badges)
Live/Active Status (Green)	#00C853 / #7ED957	Indicates active monitoring or good connection

Accent Blue	#3FA9F5	Used for throughput, location (GPS), buttons
Text Colors	Mostly white (#FFFFFF) with ~90–95% opacity for readability	
Borders / Containers	White, ~10% fill, ~95% stroke for subtle contrast	

Color Use Strengths:

- High contrast between text and background
- Consistent use of color coding for context (green = active, yellow = feedback, blue = data points)

Color Use Opportunities:

- Can incorporate a **secondary accent color** to emphasize user interaction (e.g., red for poor connection, purple for analytics)
- Add slightly **stronger contrast** for section headers or call-to-actions

3. Typography

Table 2: Typography properties

Attribute	**Value**
Font Family	Poppins

Style	Mostly regular and bold
Text Hierarchy:	• **Titles**: Bold, capitalized (e.g., "Network • Analysis", "Context Information") • **Subtitles**: Regular or medium, aligned left for readability • **Body Text**: Clean, easy-to-read at small sizes

Reason for choosing Font:

- Poppins contributes to a **neutral, clean, and accessible** look.

4. Layout & Iconography

- Used a **card-based layout** with well-defined, rounded containers.
- Emphasized **user interaction through emoji feedback**, toggle buttons, and GPS tags.
- Icons are minimalist and descriptive (e.g., call, video, indoor/outdoor).
- **Good visual grouping** with uniform padding and consistent spacing

5. Brand Voice & Personality

Table 3: Brand personality

Trait	Evidence in UI
Professional	Dark color palette, structured layout
Trustworthy	Clear analytics, labeled icons, verified location info
User-centric	Emoji feedback, direct experience rating system
Calm/Measured	No overwhelming animations, clean text hierarchy

6. Strengths of Current Brand Identity

- Consistent, focused dark theme enhances data readability.
- Simple UI elements support easy navigation and comprehension.
- Visual language effectively distinguishes between feedback levels and contexts.
- Feedback interface is **immediate and intuitive**, matching real-time use case.

Figma Implementation

Overview

This documentation covers the interconnection of the various screens of the Quality of Experience application designed to collect user experiences and technical data about cellular network performance.

1. Home Screen

Purpose:

Primary dashboard showing real-time network metrics and entry point for user feedback.

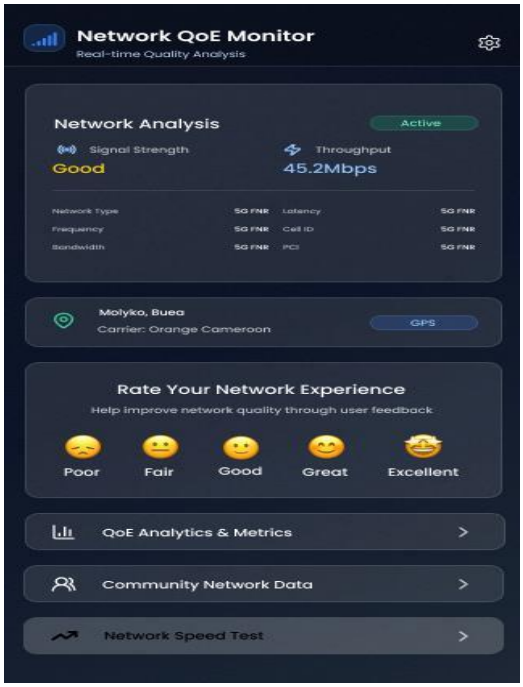

Figure 1

UI Components

1. Header
2. Network Analysis Section
3. Technical Network Details:
    - Network Type
    - Frequency
    - Bandwidth
    - Latency
4. Location Information :
    - Area
    - Carrier
5. Call-to-Action Button
6. Rating Options

2. Feedback Form Screen

Purpose:

Detailed feedback collection about network quality issues. UI Components:

1. Header
2. Rating Section
3. Context Information:
4. Situation Context
5. Specific Issues Section

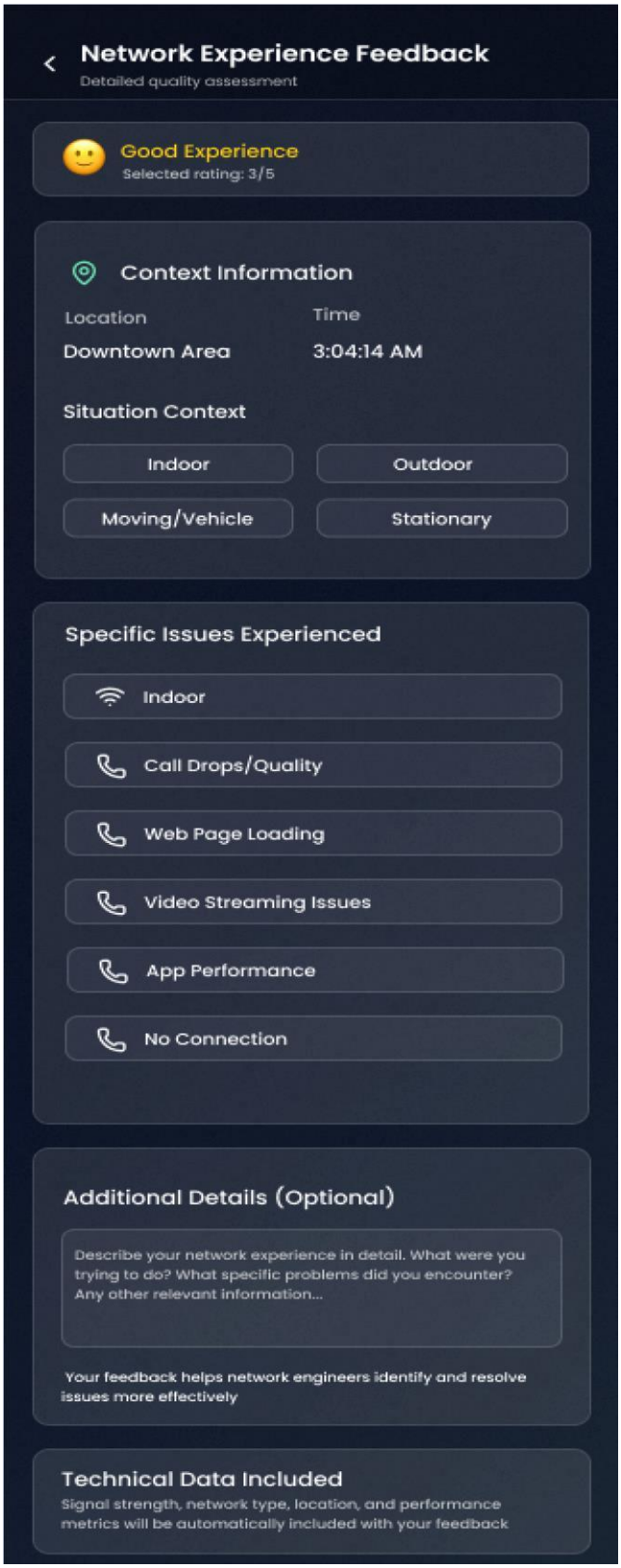
Network Experience Feedback
Detailed quality assessment
Good Experience
Selected rating: 3/5
Context Information
Location
Downtown Area
Time
3:04:14 AM
Situation Context
Indoor
Outdoor
Moving/Vehicle
Stationary
Specific Issues Experienced
Indoor
Call Drops/Quality
Web Page Loading
Video Streaming Issues
App Performance
No Connection
Additional Details (Optional)
Describe your network experience in detail. What were you trying to do? What specific problems did you encounter? Any other relevant information...
Your feedback helps network engineers identify and resolve issues more effectively
Technical Data Included
Signal strength, network type, location, and performance metrics will be automatically included with your feedback

Figure 2

4. Community Network Insights and Network Performance analytics

Purpose: Crowd sourced network quality visualization

Figure 3

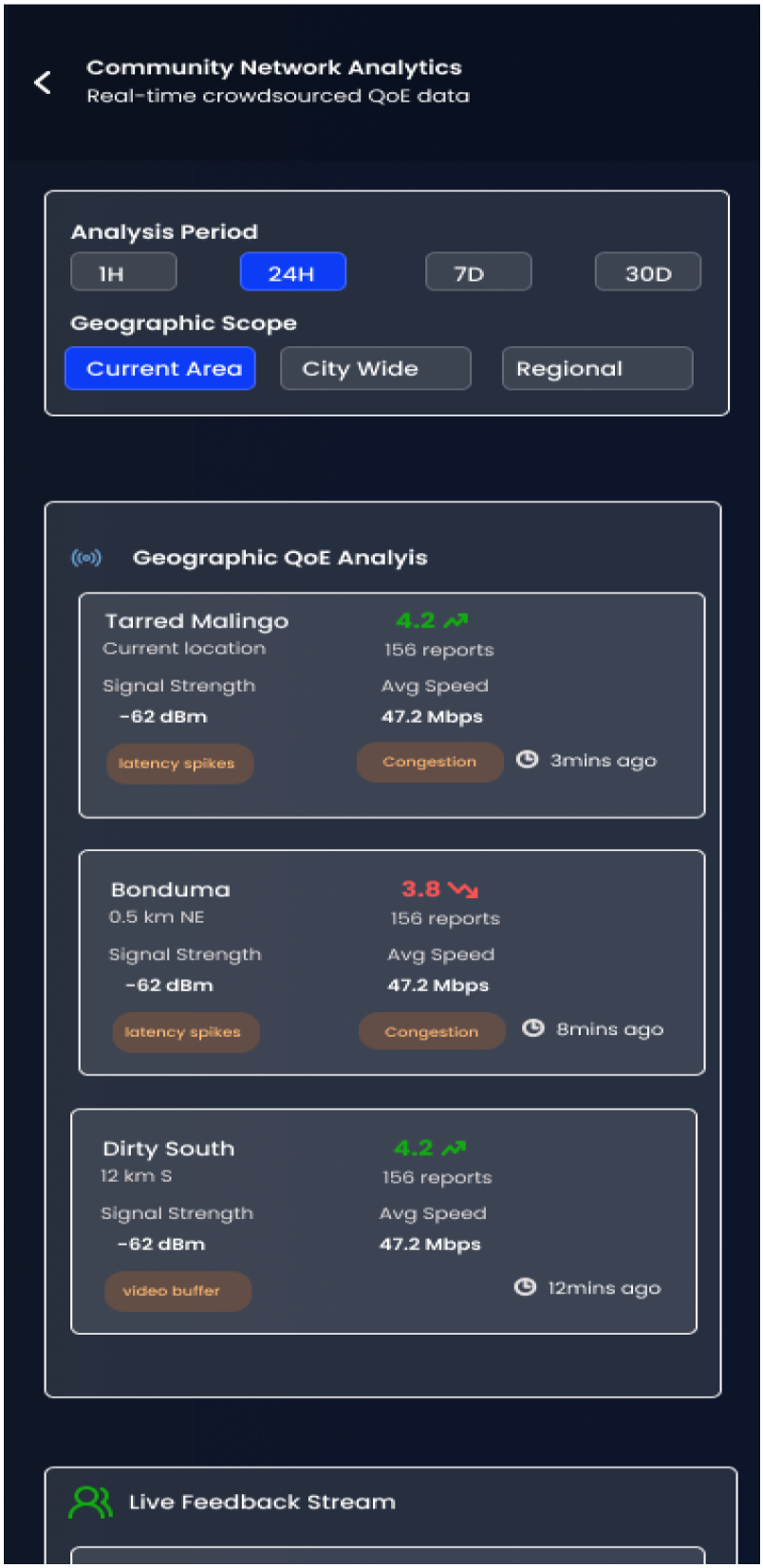
Community Network Analytics
Real-time crowdsourced QoE data
Analysis Period
1H
24H
7D
30D
Geographic Scope
Current Area
City Wide
Regional
Geographic QoE Analyis
Tarred Malingo
Current location
4.2
156 reports
Signal Strength
-62 dBm
Avg Speed
47.2 Mbps
latency spikes
Congestion
3mins ago
Bonduma
0.5 km NE
3.8
156 reports
Signal Strength
-62 dBm
Avg Speed
47.2 Mbps
latency spikes
Congestion
8mins ago
Dirty South
12 km S
4.2
156 reports
Signal Strength
-62 dBm
Avg Speed
47.2 Mbps
video buffer
12mins ago
Live Feedback Stream

Figure 4

UI Components:

1. Time filter
2. Scope Selector
3. Geographical Analysis
4. Signal Strength
5. Issue indicators
6. Live Feed
7. Issue Analysis

Interaction Flow:

1. User adjusts time/scope filters
2. Cards dynamically update
3. Clicking location card → Drills down to area details

5. Metric Performance

Purpose: Historical trend analysis

UI Components:

1. Time Filter
2. Trend Chart
3. Performance Summary

6. Settings

Purpose: System Configuration

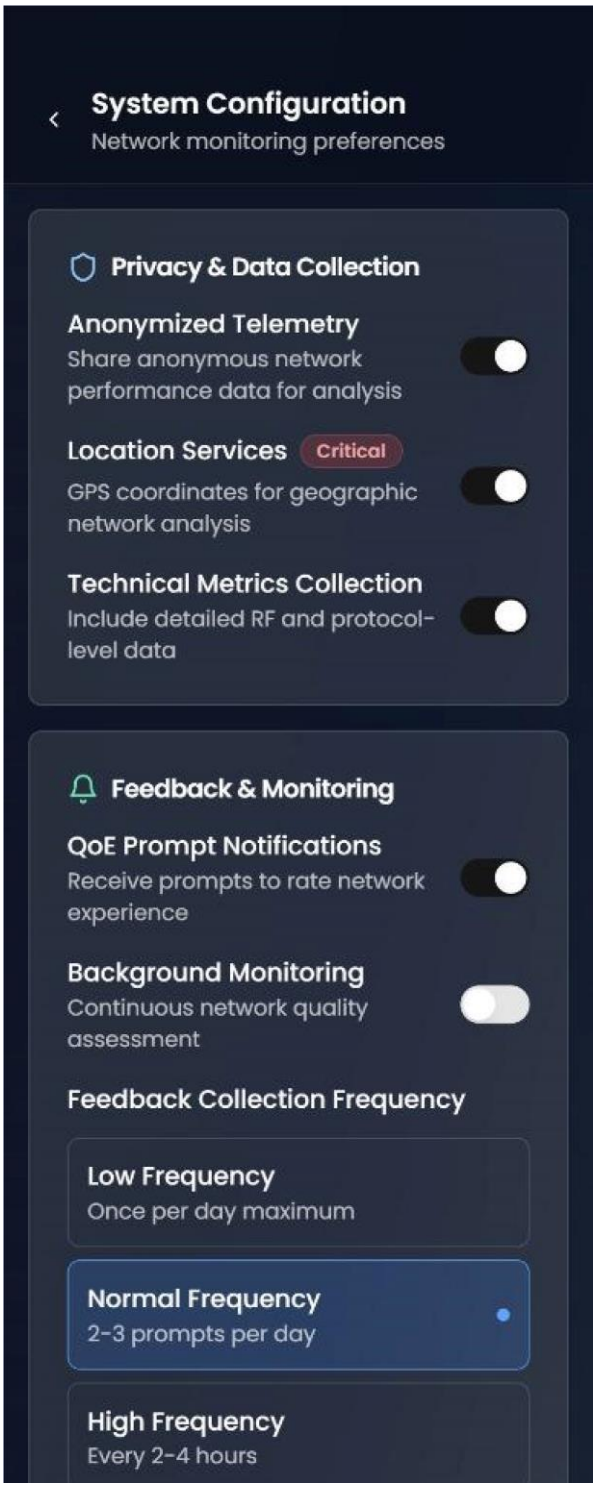
System Configuration
Network monitoring preferences
Privacy & Data Collection
Anonymized Telemetry
Share anonymous network performance data for analysis
Location Services
Critical
GPS coordinates for geographic network analysis
Technical Metrics Collection
Include detailed RF and protocol-level data
Feedback & Monitoring
QoE Prompt Notifications
Receive prompts to rate network experience
Background Monitoring
Continuous network quality assessment
Feedback Collection Frequency
Low Frequency
Once per day maximum
Normal Frequency
2-3 prompts per day
High Frequency
Every 2-4 hours

Figure 5

UI Components:

1. Privacy Toggle
2. Notification settings
3. System info

7. Speed Test Flow

The Speed Test screen measures and analyzes the device's network performance in real-time, providing

- Download/Upload Speed (Mbps)
- Latency (ms)
- Jitter (ms)
- Packet Loss (%)
- Performance Rating

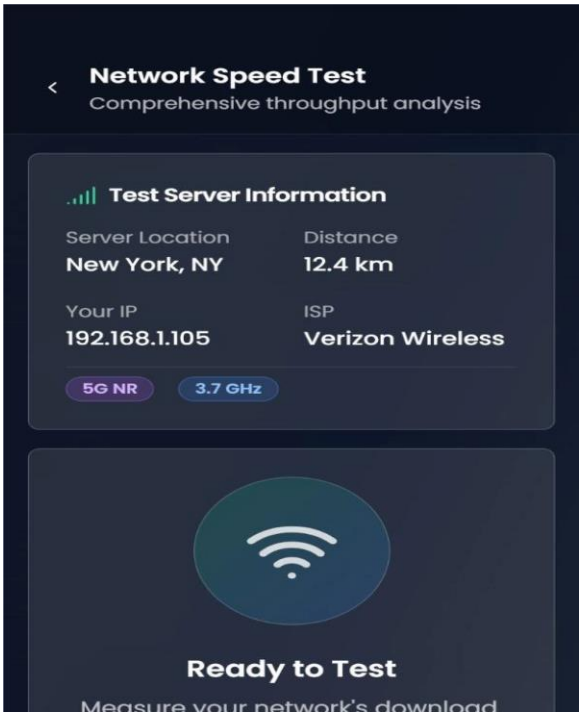

Figure 6

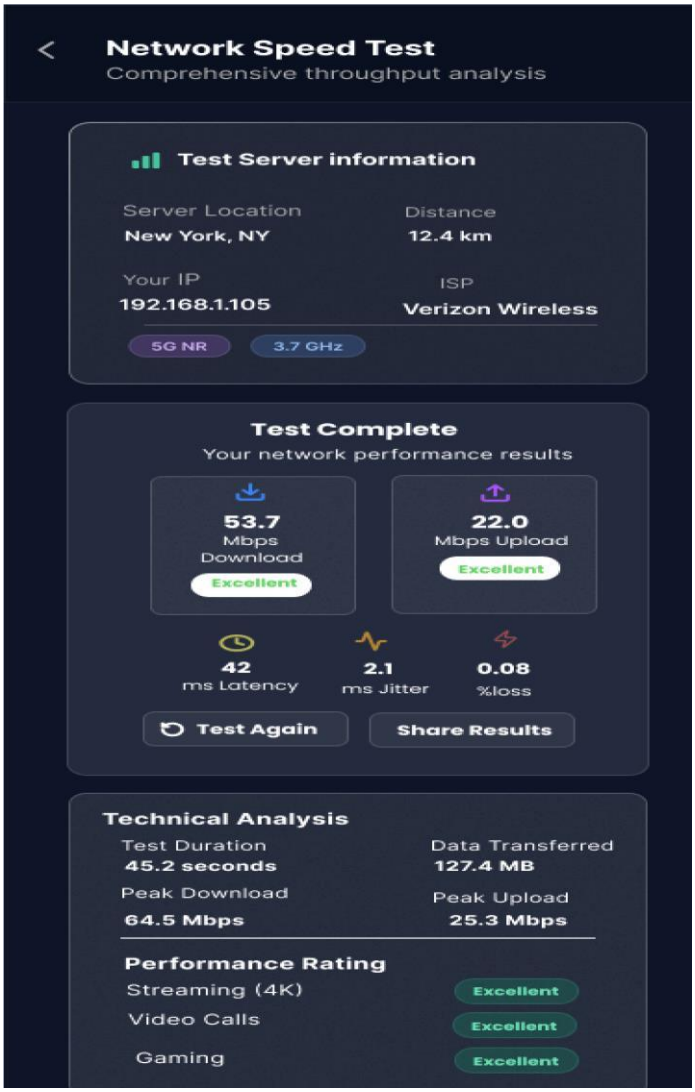

Figure 7

UI Components

1. Performance Rating
2. Result Visualization
3. Share Functionality

Technical Specs

- Test duration
- Minimum test size
- Latency measured via ICMP packets

Frontend Implementation Overview

Tools & Purpose

1. Development Environment

- VS Code
    - Primary code editor with extensions for React Native debugging and formatting.
    - Used for writing all JavaScript/TypeScript code and UI components.

2. Core Technologies

- React Native
    - Builds the mobile app for iOS and Android from a single codebase.
    - Handles UI rendering, navigation, and state management.
- Expo
    - Simplifies development with pre-configured tools (e.g., testing on devices, over-the-air updates).
    - Useful for rapid prototyping but may limit native module access.

3. UI & Icons

- Lucide React
    - Provides clean, customizable icons (e.g., Wi-Fi, speed gauge, alert symbols).
    - Integrated into buttons, status indicators, and menus.

Workflow Summary

1. Setup

- Install React Native/Expo.

- Configure VS Code with recommended extensions.

2. UI Development

- Screens built with React Native components
- Icons added from Lucide for visual cues

Implementation

Below are the following UI implementation of our various screens

1. Home Screen

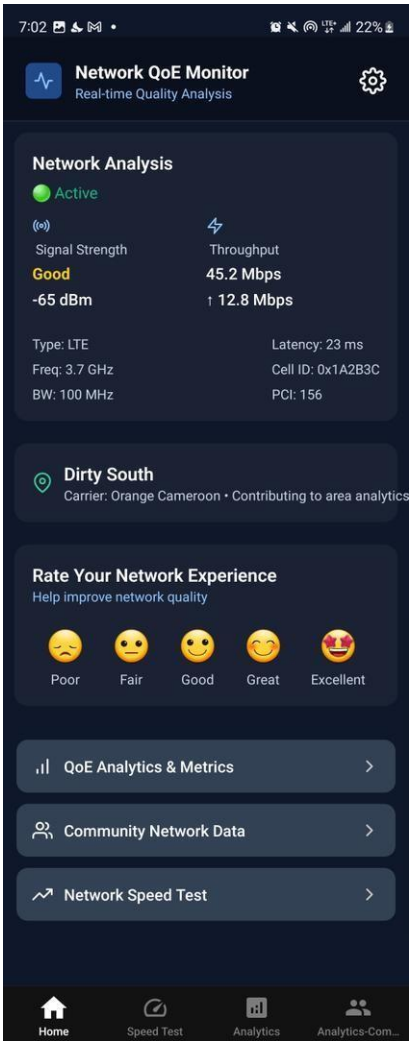

Figure 8

2. Analytics Community

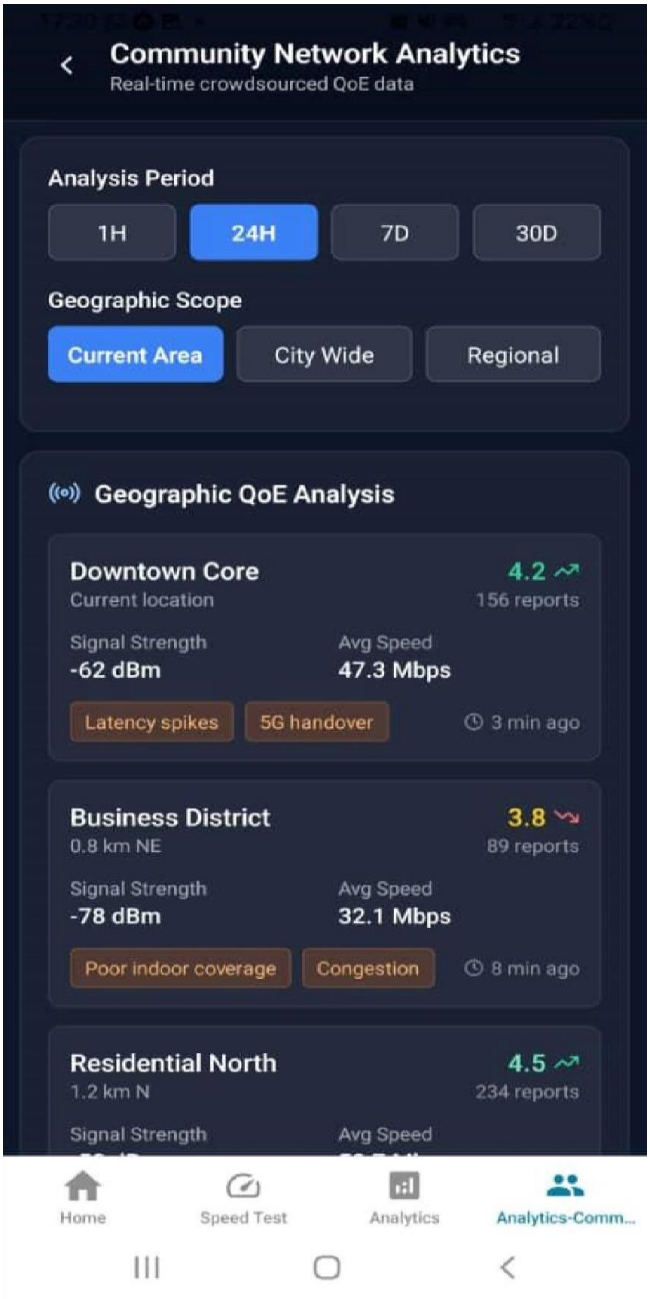

Figure 9

3. Network Analytics

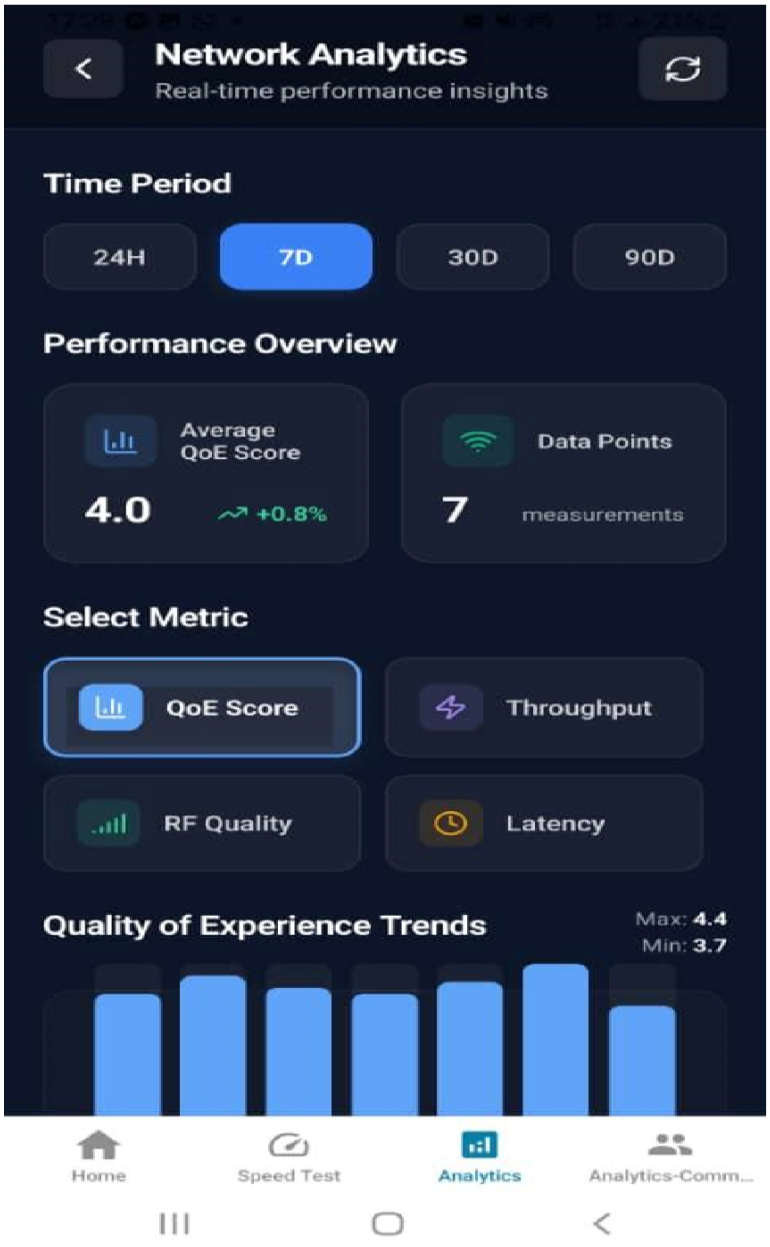

Figure 10

3. Settings Screen

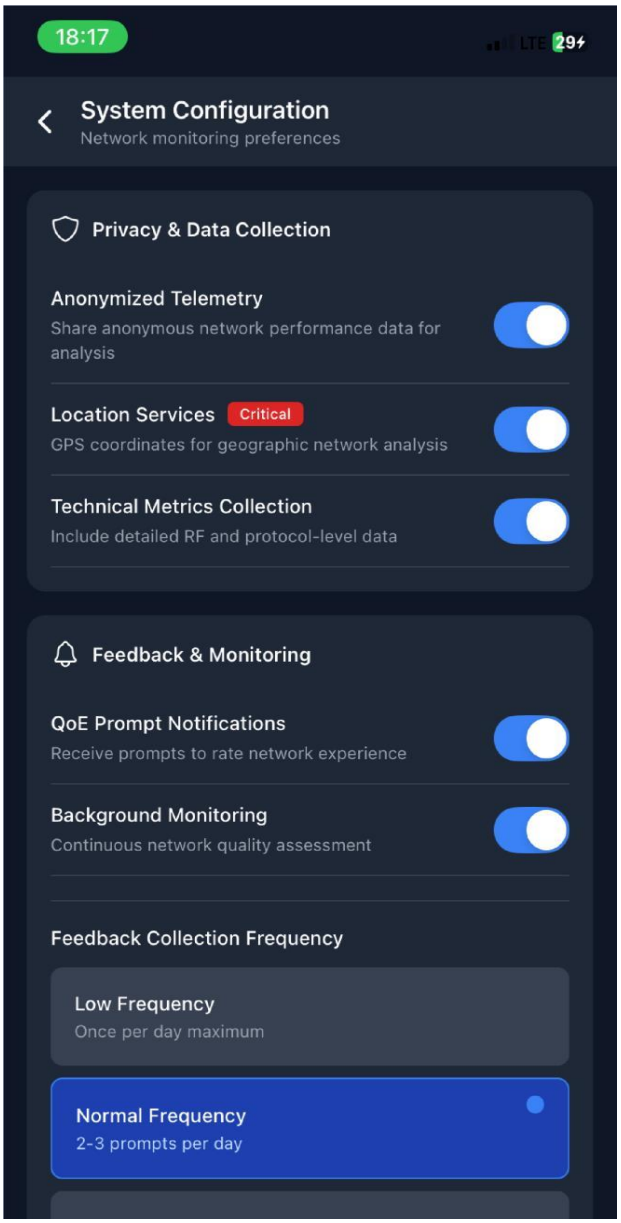

Figure 11

4. **Speed test**

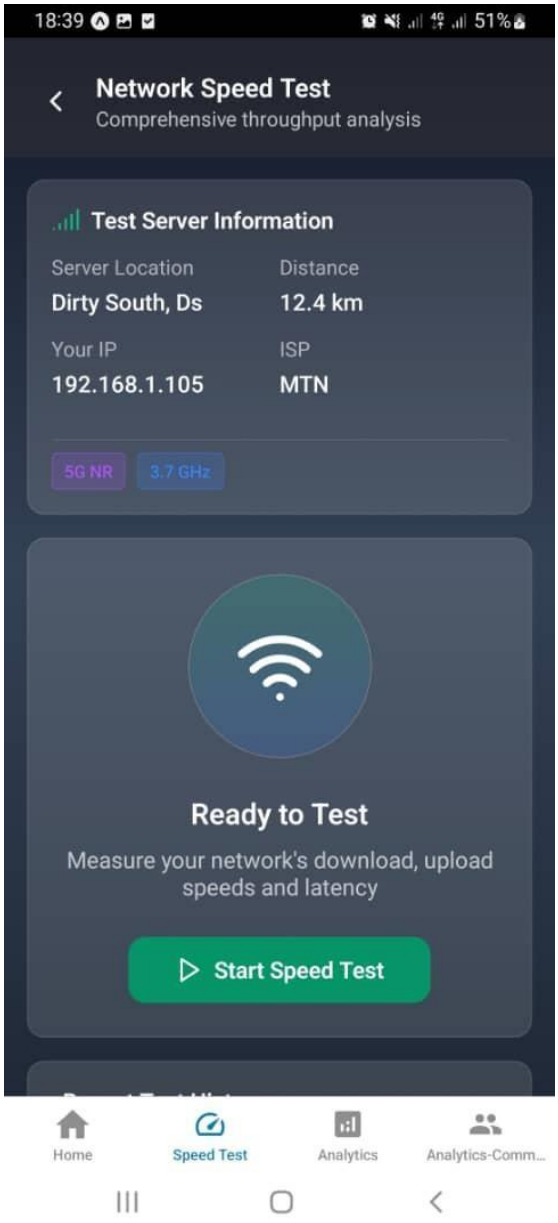

Figure 12

6. Feedback Screen

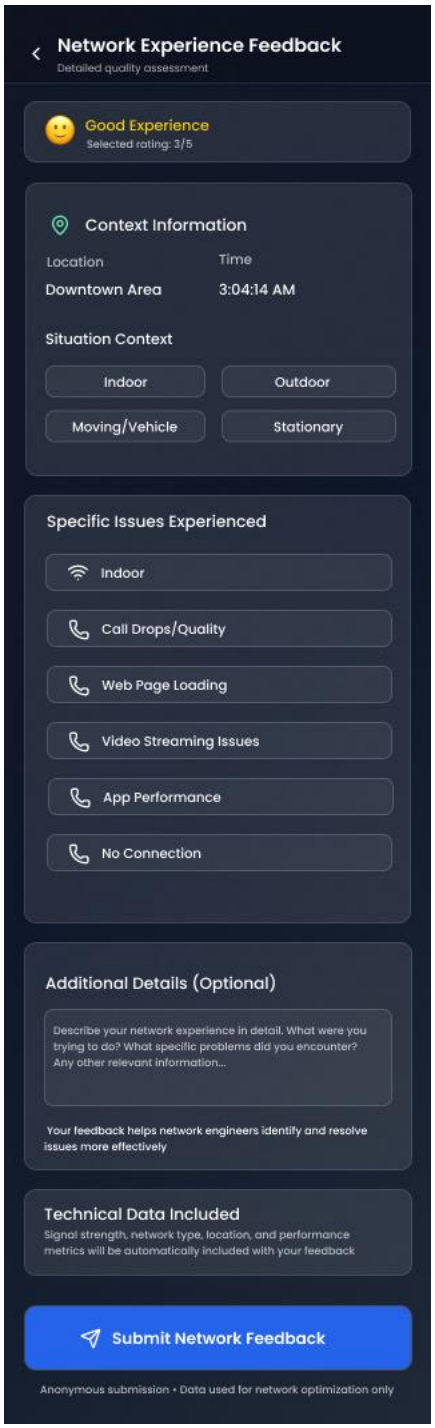

Figure 13

Conclusion

The Figma design and code implementation worked hand-in-hand to create a **clean, functional network monitoring app**. Key wins:

- **Design**: Intuitive layout, clear data visualization, and consistent icons (Lucide).
- **Development**: Fast, modular React Native application.
- **Result**: A user-friendly tool that simplifies network diagnostics and feedback.

Figma reference link: https://www.figma.com/design/faHGtiWW0cQx9CrZyWAw1i/Internet-Programming?node-id=34-2849&p=f&t=s8HZqLJ5TXQCuRjJ-0

Link to Source Code: https://github.com/internet-programming-projects-group-14/source-code