Lab 1: Problem Discovery and Need Identification

Title

Problem Discovery and Need Identification for Excessive Data and Battery Consumption in Mobile Applications

Step 1: Observation

Observation Description

The usage of mobile applications was observed among students and working professionals during daily activities such as social media browsing, online classes, video streaming, and navigation.

Observed Points

- Users keep mobile data and background apps running continuously.
- Battery drains faster even when the phone is idle.
- Apps auto-refresh and sync without user awareness.
- Frequent notifications wake the screen and consume power.
- Poor network signal increases data and battery usage.

Constraints Identified

- Limited battery capacity
- Expensive mobile data plans
- Background processes controlled by apps, not users

Output: Observation Log

- Frequent charging required (2–3 times/day)
- Unexpected data usage increase
- Phone overheating
- User frustration due to fast battery drain

Step 2: User Identification

Stakeholder List

User Group	Role	Expectations
Students	Use apps for learning & communication	Long battery life, low data usage
Working Professionals	Use apps for work & meetings	Reliable performance, efficiency
App Developers	Design and maintain apps	High engagement, feature-rich apps
Network Providers	Provide internet services	Stable connectivity, controlled usage

Step 3: Interviews / Surveys

Sample Open-Ended Questions

1. How often do you experience fast battery drain?

2. Which apps consume most data on your phone?

3. Do you monitor app data usage regularly?

4. How does battery drain affect your daily activities?

5. Do you feel apps use data unnecessarily in the background?

6. Have you tried any battery/data saving features?

7. What frustrates you most about mobile app usage?

Interview Summary

- Interviews conducted with **30 users**

- Majority complained about **background data usage**

- Many users were unaware of which apps consume the most power

- Users felt frustrated when battery drained during emergencies

- Auto-play videos and background syncing were common complaints

Step 4: Pain-Point Analysis

Pain-Point Table

Pain Point	Category
Fast battery drain	Functional
High mobile data consumption	Functional
Phone overheating	Functional
Anxiety about battery availability	Emotional
Frustration due to frequent charging	Emotional
Lack of user control over background activity	Systemic

Critical Pain Point

➡ **Uncontrolled background activity of mobile apps**

Step 5: Root Cause Identification (5-Why Analysis)

Problem

Mobile apps consume excessive data and battery.

1. **Why?**
   Apps run continuously in the background.

2. **Why?**
   Auto-sync, notifications, and updates are enabled.

3. **Why?**
   Apps are designed to maximize user engagement.

4. **Why?**
   There are limited restrictions enforced by default settings.

5. **Why?**
   Users lack awareness and control over app permissions.

Root Causes

- Inefficient app design

- Poor battery optimization

- Default background permissions

- Lack of user awareness

Step 6: Wicked Problem Understanding

Why this is a Wicked Problem

- Difficult to define because data and battery usage vary by user behavior.

- Multiple stakeholders (users, developers, network providers) have conflicting goals.

- Developers want engagement; users want efficiency.

- No single solution works for all apps and users.

Problem Classification

➡ **Wicked Problem**

Step 7: Reflection

Initially, it was assumed that battery drain was mainly due to poor battery quality. However, user interviews revealed that background app activity and unnecessary data usage were major contributors. Different users experienced the problem differently based on usage patterns and device configurations. This lab highlighted the importance of understanding real user pain points before proposing solutions. Jumping directly to solutions without proper analysis could ignore underlying causes and lead to ineffective fixes. Through this lab, skills such as observation, interviewing, empathy, problem analysis, and critical thinking were developed, which are essential for identifying real-world problems accurately.