

Project Reflection: Mobile User Behavior Analysis (Excel)

Understanding engagement, usage intensity, and resource consumption using KPI helper columns, PivotTables, and PivotCharts.

1) Business Context (What we wanted to find out)

This project explores simulated mobile user behavior to answer a simple business question: what separates highly engaged users from low-engagement users, and what “cost” comes with that engagement (time spent, data usage, and battery drain)?

2) Key Questions

- How many users are “active” (using the app ≥ 60 minutes/day)?
- How is engagement distributed (High / Medium / Low)?
- Do highly engaged users consume more time, data, and battery than others?
- Who are the heavy resource users (top 25% data and top 25% battery)?
- Does engagement differ by age group (<25, 25–40, 40+)?

3) Stakeholders (Who would use these insights)

- Product Manager: improve features that drive engagement without harming user experience.
- Growth/Marketing: target segments likely to become high-engagement users.
- Engineering/Mobile team: reduce battery drain and data usage for heavy users.
- Customer Support: anticipate complaints (battery/data) from intensive users.

4) Data & Scope

- Dataset size: 700 users
- Fields used heavily: Engagement_Level, App Usage Time, Screen On Time, Data Usage, Battery Drain, Age
- Tool: Microsoft Excel (Tables, formulas, PivotTables, PivotCharts)

5) Data Preparation (What I cleaned and standardized)

Before analysis, I ensured the data was consistent and PivotTable-ready.

- Verified columns had correct data types (numbers stored as numbers, text as text).
- Checked for blanks and handled them to reduce “(blank)” categories in pivots.

- Created a clean Excel Table so formulas auto-fill and pivots remain dynamic.

6) KPI Helper Columns (Formulas used)

To make analysis easier, I created helper columns that convert raw numbers into simple categories.

Active user (≥60 minutes/day):

=IF([@[App Usage Time (min/day)]]>=60,"Yes","No")

High Data User (top 25% data usage):

Threshold (single cell): =PERCENTILE.INC(Table1[Data Usage (MB/day)],0.75)

Flag (helper column): =IF([@[Data Usage (MB/day)]]>=\$O\$2,"Yes","No")

High Battery Usage (top 25% battery drain):

Threshold (single cell): =PERCENTILE.INC(Table1[Battery Drain (mAh/day)],0.75)

Flag (helper column): =IF([@[Battery Drain (mAh/day)]]>=\$P\$2,"Yes","No")

Age Group bucketing:

=IF([@Age]<25,"<25",IF([@Age]<=40,"25-40","40+"))

7) Primary Analysis (PivotTables & Charts)

I built PivotTables to summarize user counts and averages, and PivotCharts to make patterns easy to see. Key pivots included:

- Active User Rate (Yes/No)
- Engagement Distribution (High/Medium/Low)
- Engagement vs Average App Usage Time
- Engagement vs Average Screen Time
- Engagement vs Average Data Usage
- Engagement vs Average Battery Drain
- High Data Users (Top 25%)
- High Battery Users (Top 25%)
- Engagement Level by Age Group

8) Results (What the data showed)

Below are the final KPI outcomes from the PivotTables:

- Total users: 700
- Active users (≥ 60 min/day): 91.29% (639 users) | Low activity: 8.71% (61 users)
- Engagement distribution: High 418 | Medium 221 | Low 61
- Avg App Usage Time (min/day): High 388 | Medium 112 | Low 44 | Overall 271
- Avg Screen On Time (hours/day): High 7 | Medium 3 | Low 2 | Overall 5
- Avg Data Usage (MB/day): High 1333 | Medium 369 | Low 196 | Overall 930
- Avg Battery Drain (mAh/day): High 2097 | Medium 741 | Low 444 | Overall 1525
- High Data Users (Top 25%): Yes 25% | No 75%
- High Battery Users (Top 25%): Yes 25% | No 75%

9) What it means

- Engagement is strongly linked to intensity: High-engagement users spend much more time and also consume far more data and battery.
- The “cost of engagement” is real: compared to Low users, High users use $\sim 6\text{--}9\times$ more data and $\sim 4\text{--}5\times$ more battery on average.
- Most users are active (91.29%), meaning the product has strong daily usage — but efficiency becomes a key risk (battery/data).
- The top 25% heavy users are a clear segment: they are most likely to notice performance, battery drain, and data issues first.

10) Age Group Pivot

Engagement by Age Group (counts):

- <25: High 79 | Medium 19 | Low 12 (Total 110)
- 25–40: High 150 | Medium 101 | Low 25 (Total 276)
- 40+: High 189 | Medium 101 | Low 24 (Total 314)

Interpretation:

- The 40+ group is the largest segment and contributes the most High-engagement users by volume.
- The 25–40 group has a large Medium segment — ideal for conversion strategies (Medium \rightarrow High).
- Low engagement stays small across all ages, so disengagement is not concentrated in one age group.

11) Recommendations (What I would suggest to the business)

- Optimize efficiency for heavy users: improve battery/data performance for the High and Top-25% segments (compression, caching, background activity controls).
- Create a “Medium → High” plan for 25–40 users: targeted features, onboarding nudges, and value reminders to lift engagement.
- Add “usage health” monitoring: track battery and data KPIs alongside engagement so growth doesn’t create a worse user experience.
- Segment support messaging: proactively educate heavy users on data/battery settings to reduce complaints and churn.

12) Reflection (What I learned / what I would do next)

- PivotTables are powerful for fast KPI discovery — but helper columns are what make insights clean and repeatable.
- Percentages (e.g., % of Row Total) can tell a clearer story than counts when groups have different sizes.
- Next step: build a simple predictive model (or scoring) to estimate engagement from time/data/battery and identify early “upgrade” users.