

Mobile Usage Patterns: Exploring Screen Time & App Engagement Trends

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This project report outlines development and analytical insights derived from the Power BI dashboard project titled **"Mobile Usage Patterns: Exploring Screen Time & App Engagement Trends."** The dashboard was built to uncover meaningful behavioral patterns in mobile usage, screen time, and app engagement across demographics.

Dataset Overview

Primary Dataset

The dataset used for this project is named `mobile_usage_behavioral_analysis` and contains behavioral information of mobile users.

Key attributes in the dataset include:

Column	Description
User_ID	A unique identifier for each user
Age	User's age (ranging from 18 to 60)
Gender	User's gender (Male/Female)
Location	User's city of residence (e.g., New York, Los Angeles, etc.)
Daily_Screen_Time_Hours	Total screen time per day including all activity
Number_of_Apps_Used	Count of apps used by user in a day
Social_Media_Usage_Hours	Time spent on social media apps
Productivity_App_Usage_Hours	Time spent on productivity-related apps
Gaming_App_Usage_Hours	Time spent on gaming apps

Derived Tables (Power BI Engineered)

Table Name	Purpose
AgeAxis	To define numeric axis for continuous age trend visuals
AgeBinsTable	For custom binning of ages into 5-year ranges
GenderLookup	To maintain consistent gender sort order in visuals
App_Usage_By_Type	Extended with custom calculated columns and usage aggregations

Derived columns were added to enable better sorting (e.g., Age_Group_Sort, Age_Group_Label) and categorical breakdowns for clear grouping.

Tools Used: Power BI, DAX

Dashboard Layout & Visuals

The dashboard is composed of **five summary KPIs** and **five main visuals**, all interactive and responsive to filters with cross-filtering.

Top Row: Summary KPI Cards

These dynamic tiles display average values across all users, for example:

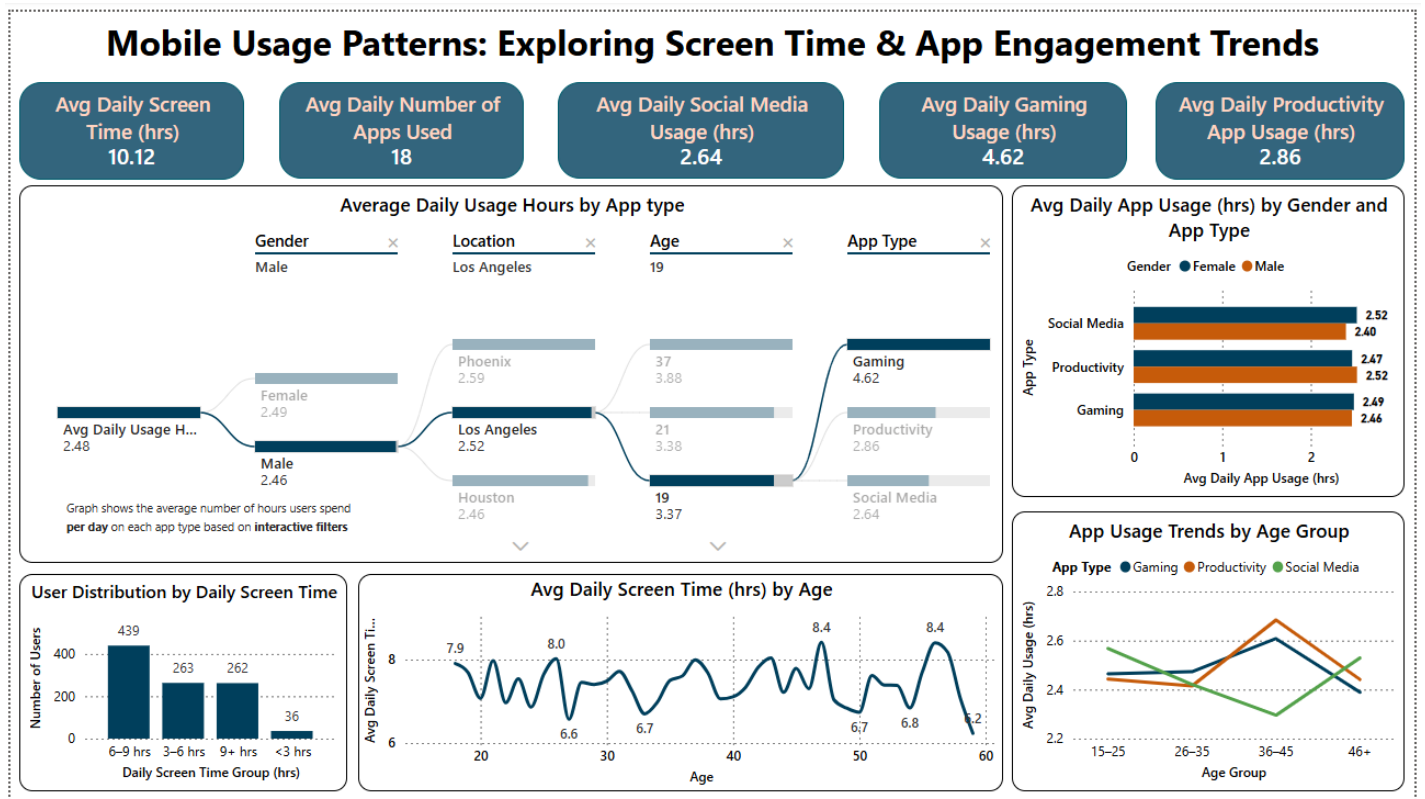
Metric	Value
Avg Daily Screen Time (hrs)	7.78
Avg Daily Number of Apps Used	16
Avg Daily Social Media Usage (hrs)	3.58
Avg Daily Gaming Usage (hrs)	1.51
Avg Daily Productivity App Usage (hrs)	2.11

These cards offer a quick-glance summary of overall usage behavior.

Dashboard Overview

Interactivity Notes

- **Synchronized visuals:** Filtering one chart affects others unless disabled (seen via the “no impact” icon).
- **Hover tooltips:** All visuals show precise metrics on hover.
- **Visual layering and text elements:** Organized using the Power BI Selection Pane for optimal readability.



Average Daily Usage Hours by App Type

Mobile Usage Patterns: Exploring Screen Time & App Engagement Trends

Avg Daily Screen Time (hrs)
7.50

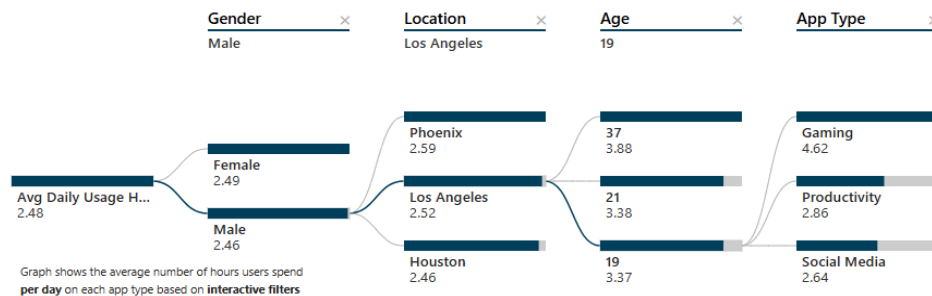
Avg Daily Number of Apps Used
17

Avg Daily Social Media Usage (hrs)
2.55

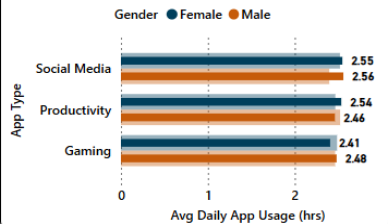
Avg Daily Gaming Usage (hrs)
2.45

Avg Daily Productivity App Usage (hrs)
2.50

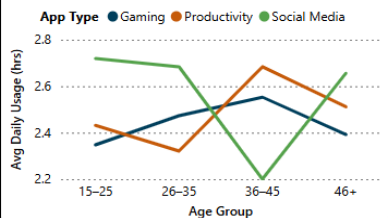
Average Daily Usage Hours by App type



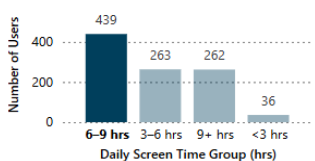
Avg Daily App Usage (hrs) by Gender and App Type



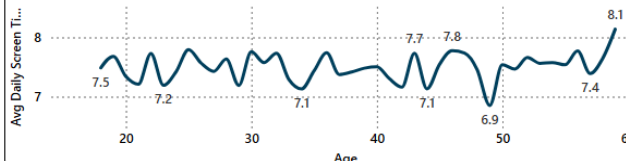
App Usage Trends by Age Group



User Distribution by Daily Screen Time



Avg Daily Screen Time (hrs) by Age



User Distribution by Daily Screen Time

Mobile Usage Patterns: Exploring Screen Time & App Engagement Trends

Avg Daily Screen Time (hrs)
8.41

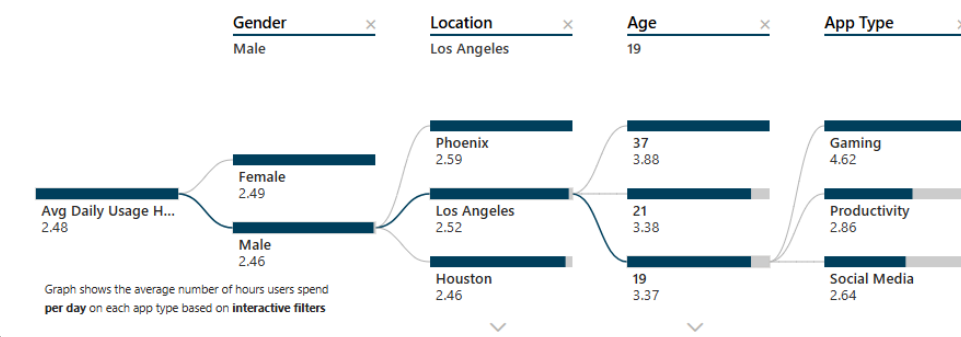
Avg Daily Number of Apps Used
18

Avg Daily Social Media Usage (hrs)
3.30

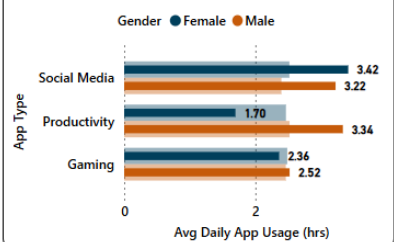
Avg Daily Gaming Usage (hrs)
2.46

Avg Daily Productivity App Usage (hrs)
2.65

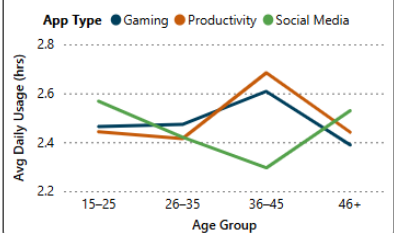
Average Daily Usage Hours by App type



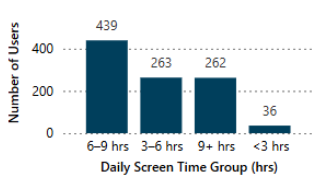
Avg Daily App Usage (hrs) by Gender and App Type



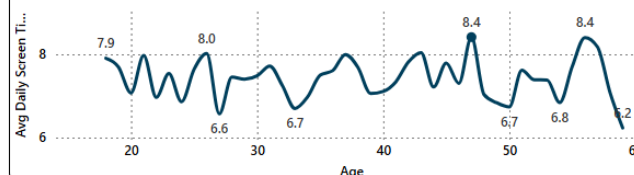
App Usage Trends by Age Group



User Distribution by Daily Screen Time



Avg Daily Screen Time (hrs) by Age



Average Daily Screen Time (hrs) by Age

Mobile Usage Patterns: Exploring Screen Time & App Engagement Trends

Avg Daily Screen Time (hrs)
7.43

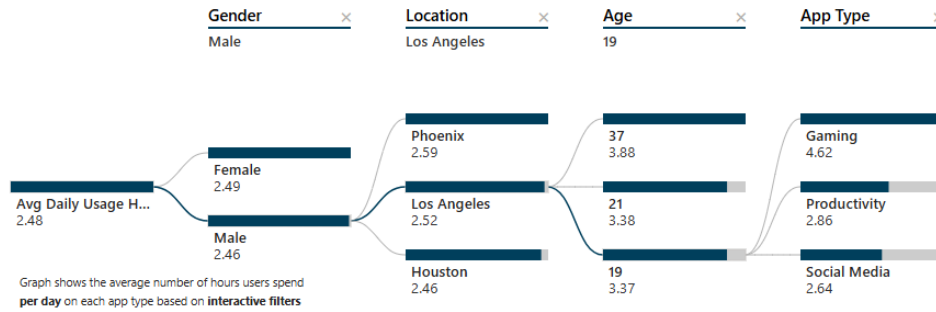
Avg Daily Number of Apps Used
17

Avg Daily Social Media Usage (hrs)
2.46

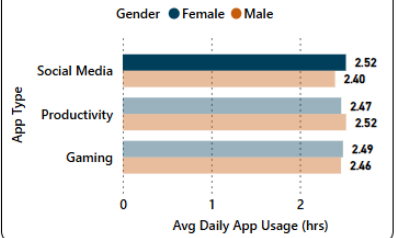
Avg Daily Gaming Usage (hrs)
2.48

Avg Daily Productivity App Usage (hrs)
2.50

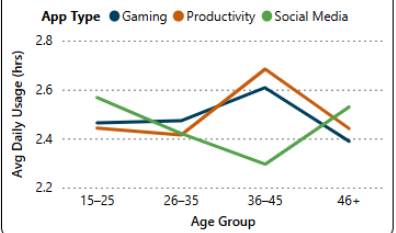
Average Daily Usage Hours by App type



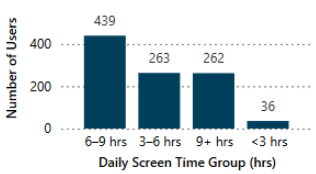
Avg Daily App Usage (hrs) by Gender and App Type



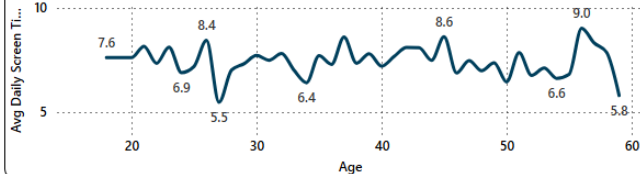
App Usage Trends by Age Group



User Distribution by Daily Screen Time



Avg Daily Screen Time (hrs) by Age



Average Daily App Usage (hrs) by Gender and App Type

Mobile Usage Patterns: Exploring Screen Time & App Engagement Trends

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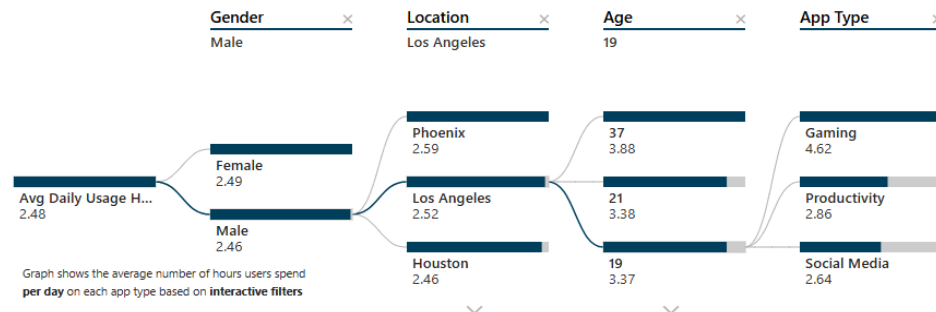
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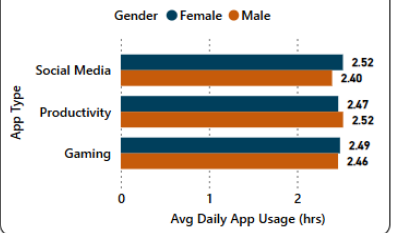
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2.50

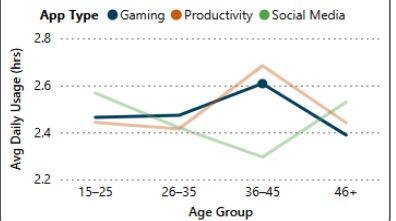
Average Daily Usage Hours by App type



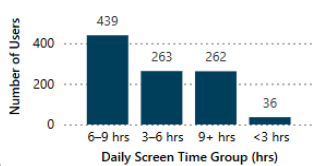
Avg Daily App Usage (hrs) by Gender and App Type



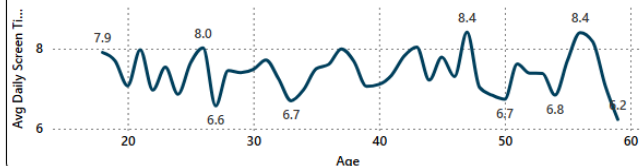
App Usage Trends by Age Group



User Distribution by Daily Screen Time

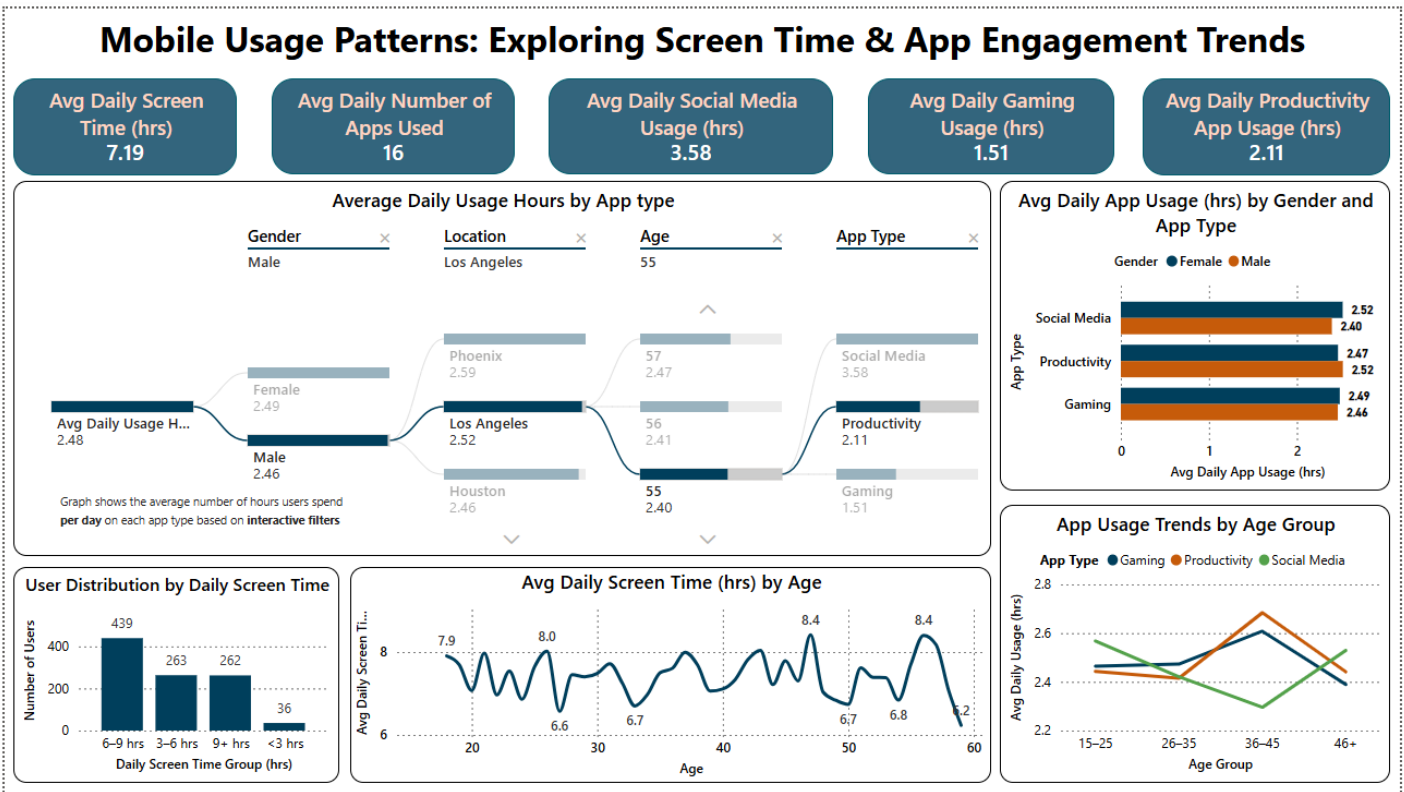


Avg Daily Screen Time (hrs) by Age



App Usage Trends by Age Group

Visual Analysis & Detailed Insights



Interaction Example

1. Decomposition Tree: Avg Daily Usage Hours by App Type

- **Purpose:** Drill down into average daily app usage from an overall level to specific demographics.
- **Hierarchy Path:** Gender → Location → Age → App Type
- **Interaction Example** (Selection: **Male, Los Angeles, Age 55**):
 - **Social Media: 3.58 hrs**
 - **Productivity: 2.11 hrs**
 - **Gaming: 1.51 hrs**
- **Key Insight:** The selected user segment group spends the most time on Social Media, followed by Productivity apps, with the least on Gaming.

2. Bar Chart: Avg Daily App Usage (hrs) by Gender and App Type

- **Purpose:** Compare male vs. female app usage across categories.
- **Insights:**
 - **Social Media:** Females (2.52 hrs) > Males (2.40 hrs)
 - **Productivity:** Males (2.52 hrs) > Females (2.47 hrs)
 - **Gaming:** Females (2.49 hrs) > Males (2.46 hrs)
- **Key Insight:** Across all categories, the differences between genders are **very small** (all under 0.1 hrs). While **females lead slightly in Social Media and Gaming**, **males use Productivity apps just a bit more**.

3. Histogram: User Distribution by Daily Screen Time

- **Purpose:** Display how users are spread across screen time brackets.
- **Insights:**
 - **6–9 hrs/day:** Largest group (439 users)
 - **3–6 hrs/day:** 263 users
 - **9+ hrs/day:** 262 users
 - **<3 hrs/day:** Only 36 users
- **Key Insight:** Most users (71%) spend **more than 6 hours daily** on screens, indicating **high overall screen dependency**.

4. Line Chart: Avg Daily Screen Time (hrs) by Age

- **Purpose:** Show variation in average screen time across different ages.
- **Insights:**
 - **Peaks** at Age 18 (7.9 hrs), 26 (8.0 hrs), 47 (8.4 hrs), 56 (8.4 hrs)
 - **Lows** at Age 27 (~6.6 hrs), 33 (~6.7 hrs), 50 (~6.7 hrs), 59 (~ 6.23 hrs)
- **Key Insight:** Screen time **fluctuates significantly across ages**, with **notable peaks in early adulthood (18, 26) and late 40s to mid-50s (47, 56)**. The **lowest engagement occurs in late 20s to early 30s and again near retirement age**, suggesting varying digital behavior likely driven by lifestyle and work-life balance changes at different life stages.

5. Line Chart: App Usage Trends by Age Group

- **Purpose:** Compare usage of app categories across age ranges.
- **Insights:**
 - **Social Media:** Highest in **15–25** group, declines steadily with age and rises from 36-45 group
 - **Productivity:** Peaks in **36–45** group (~2.7 hrs), lowest in **26-35**
 - **Gaming:** Fairly flat, slightly higher in **36-45** group, minor drop after
- **Key Insight:**
 - **Younger users** prefer **Social Media and Gaming**
 - **Middle-aged users (36–45)** are most engaged in **Productivity apps**
 - This reflects **shifting digital priorities with age**.

6. KPI Tiles: Summary Metrics

- **Avg Daily Screen Time:** 7.19 hrs
- **Avg Daily Number of Apps Used:** 16
- **Avg Daily Social Media Usage:** 3.58 hrs
- **Avg Daily Gaming Usage:** 1.51 hrs
- **Avg Daily Productivity App Usage:** 2.11 hrs
- **Key Insight:** Users spend **half of their screen time on Social Media**, and use a **broad variety of apps (16 daily)**.

Summary

This Power BI dashboard provides a clear, engaging overview of how users interact with mobile devices based on age, gender, location, and app categories. All visuals are built with interactivity and clarity in mind.

The analysis can support:

- App development and personalization strategies
- Marketing segmentation by behavior
- UX research and product strategy targeting based on engagement levels