Bellabeat Case Study

Smart Device Usage Analysis

*Tool stack: **R (RStudio) • PostgreSQL (DBeaver) • Excel (Microsoft 365 Web)***
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Business Task

The objective of this analysis is to identify **activity, sleep, and engagement patterns** in smart device usage data and translate these insights into **actionable recommendations** for Bellabeat's Leaf product. The goal is to support healthier user habits and improve product engagement.

Data Overview

- **Source:** Fitbit Fitness Tracker Data (Kaggle, Mobius)
- **Time period:** April 2016 – May 2016
- **Scope:** Daily activity, sleep behavior, and user engagement metrics
- **Limitations:**
  - Fitbit users, not Bellabeat users
  - Short time window
  - Limited demographic information

Despite these limitations, the data is suitable for identifying **directional behavioral trends**.

Tools & Process

- **R (RStudio)**: Data cleaning, validation, feature creation (e.g., weekday vs weekend), and exploratory analysis, and visualizations.
- **PostgreSQL** + **DBeaver**: Aggregation, KPI creation, weekday/weekend comparisons, and engagement segmentation using validated views.
- **Excel Web** (Microsoft 365): Power Query import, consistent charts, and dashboard creation.

Key Findings

- **Activity Patterns**

  - Step counts vary across the week, peaking on Tuesdays and weekends.
  - Sundays show the lowest activity levels.

1. **Sleep Behavior**
   - Sleep duration is relatively consistent on weekdays.
   - Users sleep longer on weekends, suggesting weekday sleep debt.
2. **Weekday vs Weekend Differences**
   - Weekends are associated with both higher activity and longer sleep.
   - This reflects different lifestyle patterns between workdays and rest days.
3. **User Engagement**
   - Most users fall into the high-engagement category.
   - A smaller group shows moderate to low engagement, indicating retention opportunities.

Business Recommendations

- Introduce **weekday-specific activity nudges** to support consistency on low-activity days.
- Promote **sleep routine features** (bedtime reminders, recovery insights) during weekdays.
- Design **targeted experiences for low-engagement users**, such as simplified goals and motivational prompts.
- Leverage higher weekend activity with **optional challenges or long-walk goals**.