Bellabeat Case Study: How Can a Wellness Technology Company Play It Smart?

📌 Author: Hassan Raza

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📌 Tools Used: Python, Pandas, Seaborn, Matplotlib, Kaggle

# 🔍 Step 1: ASK – Business Task

Analyze smart device usage data to gain insight into how consumers use non-Bellabeat devices and apply those insights to guide Bellabeat's marketing strategy for one of their products. Key business questions include:  
1. What are some trends in smart device usage?  
2. How could these trends apply to Bellabeat customers?  
3. How could these trends help influence Bellabeat marketing strategy?

# 📦 Step 2: PREPARE – Data Source

Dataset: Fitbit Fitness Tracker Data (CC0 Public Domain, via Kaggle)  
- 30 users’ minute-level and daily activity data  
- Includes data on steps, sleep, calories, heart rate, and intensity  
- Limitations: Small sample size, data from 2016–2018  
ROCCC Check: Reliable, Original, Comprehensive, Cited, but not Current.

# 🧹 Step 3: PROCESS – Data Cleaning

Performed data cleaning in Python (Pandas):  
- Checked and removed duplicate rows (e.g., heartrate had 23,424 duplicates)  
- Converted date-time fields to proper datetime format  
- Standardized formats across datasets  
- Dropped null columns where needed (e.g., 'Fat' in weightLogInfo)

# 📊 Step 4: ANALYZE – User Behavior Insights

## A. Daily Activity Summary

- 35 users, 1397 activity records  
- Average steps per day: 7,280  
- Only 30.78% of days exceeded 10,000 steps  
- Correlation between steps and calories: 0.59  
→ Opportunity to encourage more active habits through smart nudges and challenges

## B. Sleep Analysis

- 24 users, 413 sleep records  
- Average sleep duration: 7 hours  
- Sleep efficiency: 91.68%  
→ Users sleep well, but total sleep duration is borderline; Bellabeat can offer better sleep content or reminders.

# 📈 Step 5: SHARE – Visualizations & Findings

- Plotted histograms of step and sleep distribution  
- Created scatterplots for steps vs calories  
- Boxplots for sleep efficiency  
→ Visual insights support patterns found during statistical analysis

# 🔥 Step 6: ACT – Final Recommendations

1️⃣ Promote personalized step challenges to increase daily movement  
2️⃣ Visualize the link between steps and calorie burn to motivate users  
3️⃣ Offer bedtime coaching and guided meditations to improve sleep  
4️⃣ Target users with relevant content based on their habits  
5️⃣ Enhance value of Bellabeat Membership with insights, reports, and nudges