# **Bellabeat Case Study – Report**

**Google Data Analytics Capstone (Course 8)**  
 **Case Study Title:** Smart Device Fitness Data Analysis

### **1. Ask – Business Task**

The business task is to analyze smart device usage data to uncover trends in user activity, which can then be applied to improve Bellabeat’s product marketing strategy. The analysis aims to understand how consumers are using smart fitness devices and how these insights could influence Bellabeat’s approach to user engagement.

Key questions guiding the analysis:

* What are some trends in smart device usage?
* How could these trends apply to Bellabeat customers?
* How could these trends help influence Bellabeat’s marketing strategy?

### **2. Prepare – Data Source and Limitations**

The dataset used in this analysis is the “Fitbit Fitness Tracker Data” available on Kaggle. It includes personal activity tracking data from 30 Fitbit users over a period of one month. The data contains information on daily steps, activity levels, calories burned, sedentary behavior, and other health metrics.

While the dataset is publicly available and provides detailed activity tracking, it has some limitations:

* The sample size is relatively small (30 users), which may not represent a broad user base.
* Demographic information is limited, making it difficult to analyze patterns across age, gender, or location.
* The data only reflects users of Fitbit devices, not Bellabeat products directly.

Despite these limitations, the dataset offers valuable insights into general fitness tracker usage that can inform Bellabeat’s marketing strategies.

### **3. Process – Data Cleaning and Preparation**

Python was used for the entire data cleaning and analysis process, specifically with the Pandas, NumPy, and Seaborn libraries. The following steps were taken to prepare the data:

* Merged multiple CSV files to create a unified dataset.
* Converted date columns into datetime format for time-based analysis.
* Created new columns such as day of the week and month name.
* Removed null values and checked for duplicate entries.
* Selected relevant columns for analysis such as TotalSteps, Calories, and ActiveMinutes.

These steps ensured that the dataset was structured, consistent, and ready for analysis.

### **4. Analyze – Key Trends and Findings**

The analysis revealed several patterns in user activity:

* Activity levels were generally higher in April than in May, as seen in the median number of steps and active minutes.
* Weekday activity was consistently higher compared to weekends, suggesting a structured fitness routine aligned with workdays.
* A positive correlation was observed between steps taken and calories burned, indicating consistent tracking behavior.
* Sedentary minutes remained high across users, suggesting prolonged inactivity despite reaching daily step goals.

These insights highlight both opportunities and challenges in promoting healthier activity habits.

### **5. Share – Communication and Visualization**

Findings were communicated using visualizations created with Seaborn and Matplotlib. These included bar plots and time-based graphs to show trends in steps, calories burned, and active minutes by month and weekday.

Each chart was accompanied by clear markdown explanations summarizing what the visualization revealed. A final summary of insights was added to ensure clarity for non-technical audiences. The notebook was published on Kaggle to make the analysis accessible and presentable.

### **6. Act – Recommendations for Bellabeat**

Based on the analysis, the following recommendations are proposed for Bellabeat’s marketing strategy:

* Encourage users to stay active on weekends by offering motivational content or in-app challenges specifically targeting Saturday and Sunday.
* Use seasonal or monthly engagement campaigns during periods where activity tends to decline, such as May.
* Address sedentary behavior by promoting features that encourage users to take short breaks throughout the day.
* Highlight the connection between regular tracking and improved fitness outcomes in marketing content to encourage daily app engagement.
* Offer personalized tips or content based on user activity patterns to increase user retention and satisfaction.

These actions can help Bellabeat enhance user engagement, promote healthier habits, and strengthen its market presence.