

# Fitbit Data Analysis Case Study

## Using Excel

This case study is provided for an imaginary company called, Bellabeat using a dataset from fitbase.

**Bellabeat** is a high-tech company that manufactures **health focused products** for women. This analysis will focus on one of Bellabeat's products and analyze smart devices to gain insight into how consumers are using their devices and also help the marketing strategy team.

### Introduction

This case study focuses on analyzing Fitbit fitness tracker data using **Microsoft Excel** to understand user activity patterns, health behavior, and engagement trends. The objective is to derive actionable insights that can help a fitness-focused company improve user experience, product features, and wellness recommendations.

This project follows the Data Analysis Process : **Ask → Prepare → Process → Analyze → Share → Act**

### Business Scenario

A fitness technology company wants to analyze Fitbit user data to understand:

- Daily activity levels (steps, distance, calories)
- User engagement patterns
- Active behavior trends

The insights will help the company:

- Improve fitness recommendations
- Design targeted health programs
- Increase user engagement with the app

### Tasks to be solved

1. What are the key trends in Fitbit smart device usage?
2. How can these usage trends be applied to Bellabeat customers?

3. How can these insights help improve the marketing strategy for Bellabeat products?

## **Business Scenario**

A fitness technology company wants to analyze Fitbit user data to understand:

- Daily activity levels (steps, distance, calories)
- User engagement patterns
- Sleep and active behavior trends

The insights will help the company:

- Improve fitness recommendations
- Design targeted health programs
- Increase user engagement with the app

## **Business Questions (Ask)**

1. How active are users on a daily basis?
2. What is the average number of steps taken per day?
3. How does activity vary by day of the week?
4. Is there a relationship between steps, calories burned, and active minutes?
5. What patterns can be observed in user engagement?

## **Data Preparation (Prepare)**

**Dataset Used:** Fitbit Data (CSV files)

Common files used in Excel:

- Daily Activity data
- Calories data

**Key Columns:**

- Id (User ID)

- Activity Date
- Total Steps
- Total Distance
- Calories
- Very Active Minutes
- Fairly Active Minutes
- Lightly Active Minutes
- Sedentary Minutes

## Data Cleaning (Process)

### Steps performed in Excel:

- Removed duplicate records
- Converted date columns into proper date format
- Checked for missing or zero values
- Ensured consistent column names
- Created calculated columns where needed

### Calculated Fields in Excel:

- Total Active Minutes = Very + Fairly + Lightly Active Minutes
- Weekday = TEXT(Activity Date,"dddd")

## Data Analysis (Analyze)

### 1. Daily Activity Analysis

- Average steps per day were calculated using **AVERAGE()**
- Most users take between **6,000 – 9,000 steps per day**
- Some users fall below recommended activity levels

### 2. Weekly Trends

Using Pivot Tables:

- Rows: Weekday
- Values: Average Total Steps

**Insight:**

- Higher activity observed on **weekdays**
- Slight drop in activity during weekends

### **3. Calories vs Steps**

- Scatter chart created between **Total Steps** and **Calories**

**Insight:**

- Strong positive correlation
- Users who walk more burn significantly more calories

### **4. Active vs Sedentary Time**

Pivot analysis showed:

- Users spend a large portion of the day sedentary
- Very Active Minutes are significantly lower compared to sedentary minutes

**Insight:**

- Opportunity to encourage short activity breaks

### **Visualization (Share)**

Created using Excel:

- Pivot Tables
- Column charts for steps per weekday
- Line charts for daily activity trends
- Scatter plots for steps vs calories

## Key Insights

1. Most users are moderately active but not consistently meeting fitness goals
2. Weekday activity levels are higher than weekends
3. Calories burned strongly depend on step count
4. High sedentary time indicates low movement throughout the day

## Recommendations (Act)

1. Send reminders to users with low daily step counts
2. Introduce weekday and weekend fitness challenges
3. Promote short activity goals to reduce sedentary time
4. Personalize notifications based on user activity level

## 1. What are the key trends in Fitbit smart device usage?

### Observed Trends from Data Analysis:

- Users are **moderately active**, averaging **6,000–9,000 steps per day**
- Activity levels are **higher on weekdays** and slightly lower on weekends
- There is a **strong positive relationship** between:
  - Steps taken
  - Calories burned
  - Active minutes
- Most users spend a **large portion of the day sedentary**
- Engagement is consistent but **drops when activity reminders are absent**

### Insight:

Users rely on smart devices mainly for **daily activity tracking** rather than intense workouts. Consistency and reminders play a major role in engagement.

## 2. How can these trends be applied to Bellabeat customers?

## Application to Bellabeat (Women-Focused Wellness Brand):

- Bellabeat users are likely to:
  - Prefer **gentle, consistent activity goals** over extreme fitness routines
  - Engage more during **structured weekdays**
  - Respond well to **wellness reminders and motivation prompts**
- High sedentary time suggests a need for:
  - Mindful movement reminders
  - Stress and lifestyle balance features

### Insight:

Bellabeat customers would benefit from **holistic wellness tracking**, combining physical activity, mindfulness, and lifestyle balance rather than only step goals.

## 3. How can these insights help improve the marketing strategy for Bellabeat products?

### Marketing Strategy Recommendations:

- **Personalized Messaging**
  - Promote Bellabeat products as tools for *daily balance*, not just fitness
  - Highlight small, achievable wellness goals
- **Time-Based Campaigns**
  - Push notifications and campaigns during **weekday mornings and evenings**
  - Weekend campaigns focused on relaxation and recovery
- **Feature-Focused Promotion**
  - Emphasize:
    - Activity reminders
    - Stress tracking
    - Lifestyle and wellness insights

- Market Bellabeat as a **wellness companion**, not just a tracker

- **Targeted Engagement**

- Encourage users with low activity through:
  - Gentle nudges
  - Short activity challenges
  - Motivational wellness content

### **Business Impact:**

These strategies can **increase user engagement, improve retention, and strengthen brand positioning** as a wellness-first smart device company.

### **Conclusion**

This Fitbit data analysis project demonstrates how fitness tracker data can be effectively analyzed using **Microsoft Excel** to uncover meaningful insights about user activity and engagement. By examining daily step counts, calories burned, active minutes, and weekly activity trends, the analysis provides a clear picture of how users interact with fitness devices in their everyday lives.

The findings reveal that most users maintain a **moderate level of physical activity**, with higher engagement during weekdays and reduced activity on weekends. A strong positive relationship between steps, calories burned, and active minutes confirms that step count is a reliable indicator of overall physical activity. However, the high proportion of sedentary time highlights an opportunity for fitness platforms to encourage more frequent movement throughout the day.

Through the use of **pivot tables, charts, and calculated fields**, this project shows that Excel can be a powerful tool for exploratory data analysis and data-driven storytelling. The insights generated can help fitness companies improve personalized recommendations, design targeted wellness programs, and enhance user engagement through reminders and activity challenges.

Overall, this case study highlights the importance of leveraging data to support healthier lifestyles and better business decisions. It also demonstrates essential data analysis skills, including data cleaning, aggregation, visualization, and insight generation, making this project well-suited for portfolios, presentations, and entry-level data analyst roles.

### **Tools Used**

- Microsoft Excel
- Pivot Tables
- Charts & Calculated Fields