

Data Analysis Report – TIME Project (BELLABEAT)

Author: Nancy Lee YIMBERE

Tools Used: R, RStudio

Dataset: Fitbit activity tracker (Kaggle)

Duration: 1 week

Project Type: Exploratory Data Analysis (EDA)

1. Objective

Analyze Fitbit usage data to identify user behavior patterns related to physical activity and sleep. The goal is to generate actionable insights for improving TIME, BELLABEAT's connected wellness device, and guide both product development and marketing strategy.

2. Methodology

- **Data Cleaning & Preparation:** Missing values removed, data types standardized, outliers managed.
- **Aggregation & Filtering:** Daily summaries computed for key metrics.
- **Correlation & Trend Analysis:** Exploration of the relationships between activity and sedentary time, sleep efficiency, and overall user profiles
- **Visualizations:** Scatter plots, histograms, and comparative charts created using ggplot2 in R.

3. Key Insights

[**Walking and Sedentary Time: Exploring the Connection**](#)

Visualization: Scatter plot – Relationship between TotalSteps and SedentaryMinutes

There is a moderate negative correlation (**-0.327**) between daily step count and sedentary time. This suggests that users who walk more are less sedentary—highlighting the importance of regular movement.

[**Time in Bed vs. Sleep: Is There a Formula?**](#)

Visualizations: Histogram – Sleep Duration | Comparison Chart – Sleep Duration vs. Time in Bed

The average sleep duration is **419 minutes** (just under 7 hours), yet a noticeable gap between time in bed and actual sleep suggests difficulties falling asleep or nighttime awakenings for many users.

[**The Sleep-Walk Link: Exploring the Relationship**](#)

Visualization: Scatter plot – Sleep-Walk Relationship

The correlation between physical activity and sleep duration is weak. While walking is beneficial, it doesn't alone ensure better sleep—an insight crucial for accurate product positioning and marketing.

4. Strategic Recommendations

→ For the TIME Product

- **Daily Goals:** Allow users to set progressive, personalized walking objectives.
- **Active Breaks:** Suggest micro-actions to reduce sedentary behavior.
- **Sleep Features:** Add features like sleep cycle tracking, relaxing soundscapes, and personalized tips.
- **Holistic Approach:** Broaden TIME's scope beyond steps— include stress, sleep, and nutrition metrics.
- **Personalization:** Offer insights and advice tailored to each user's profile.

→ For Marketing Strategy

- **Messaging:** Highlight walking as a simple accessible wellness action
- **Education:** Communicate risks of sedentary lifestyles; promote active behavior
- **Targeting:** Segment users into activity / sedentariness clusters
- **Women Focus:** Position TIME for women with sleep challenges (e.g., insomnia)
- **Slogans:** Use taglines like "*Sleep better, without lengthening your nights.*"
- **Content Strategy:** Use science-backed information, show transparency, and provide educational content.

5. Conclusion

This project demonstrates the power of data in refining user understanding and guiding product and marketing innovation. Through this exploratory analysis, we identified meaningful correlations, clarified misconceptions, and delivered insights to help position TIME as a holistic, smart wellness companion.