From Steps to Strategy: How User Trends Shape a Fitness Company's Marketing

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1 Introduction

A case study exploring smart device usage trends to identify growth opportunities and guide marketing strategies for Bellabeat. Using Python for statistical analysis and data visualization, we address key questions related to user behaviour and engagement. Based on these insights, we provide actionable recommendations to help improve user engagement with Bellabeat's smart devices.

Key questions -

1. What are the current trends in smart device usage?
2. How could these trends apply to Bellabeat customers?
3. How could these trends help influence the Bellabeat marketing strategy?

2 Aim

To identify potential opportunities for growth and provide recommendations for Bellabeat's marketing strategy based on trends in usage of smart devices.

3 Method

- Kaggle dataset FitBit Fitness Tracker Data has been used for this case study. This dataset generated by respondents to a distributed survey via Amazon Mechanical Turk.
- 30 eligible Fitbit users consented to the submission of personal tracker data for 31 days, such as their minute-level physical activity, heart rate, and sleep monitoring.
- Data analysis and visualizations were performed in Python using Jupyter Notebooks within Visual Studio Code. The Python script can be found in fitness_trends.ipynb.

4 Results

A) Trends in device usage

- **Figure 1** provide an overview of how users allocate their time, offering valuable insights into how the device is being utilized. The predominance of **red** shades in

the visualizations is concerning, as it highlights a significant amount of sedentary behaviour—likely representing time spent sitting or lying down.

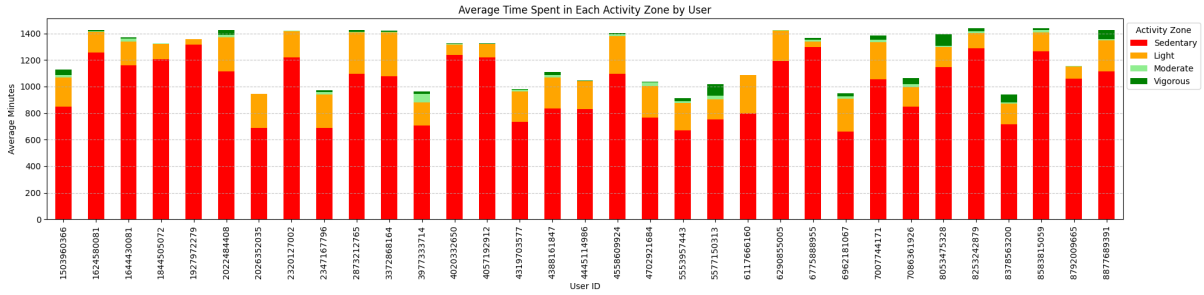

Figure 1: *This bar graph shows the activity patterns of users. The X-axis contains user ID, and the Y-axis represents average time (minutes) during the 31 days of device usage.*

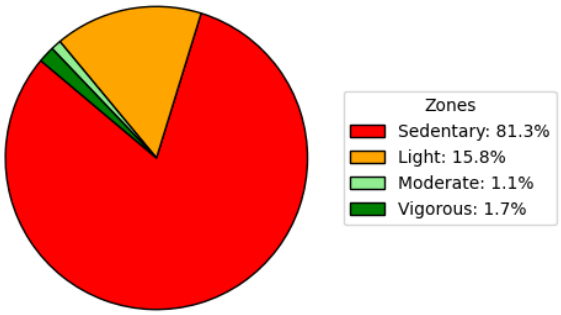

Figure 2: *Pie chart illustrating the average time spent during 31 days of the smart device usage.*

- **Figure 2** indicates that approximately 80% of the recorded time is sedentary, suggesting that the device is not being used to its full potential for promoting physical activity.
- In contrast, only around 3% of the time reflects moderate to vigorous activity, indicating limited engagement in more active behaviours.

B) Counting Daily Steps

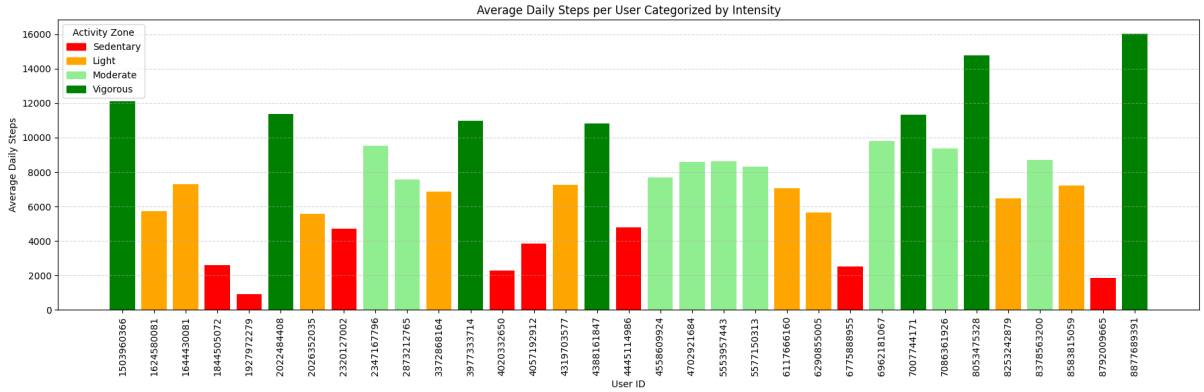

Figure 3: *Bar Graph of average daily steps in 31 days of each user, categorised into intensities.*

- **Figure 3** illustrates the trends in average daily step count per user in 31 days. Additionally, a list of users categorized by activity zone can be generated (see the *'Step Goal'* section in the python script).

C) Multiple linear regression model

- To analyse the influence of time spent in each activity zone alongside calorie expenditure, a multiple linear regression model was used.
- The independent variables are time durations spent in each activity zone, while the dependent variable is the average calorie expenditure.
- The correlation matrix in **Figure 4** shows that the least calories are expended during sedentary activity, and calorie expenditure increases with higher activity levels.

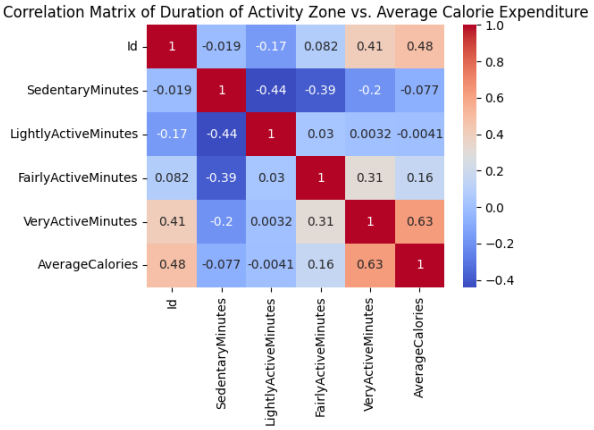

Figure 4: *Pie chart illustrating the average time spent during 31 days of the smart device usage.*

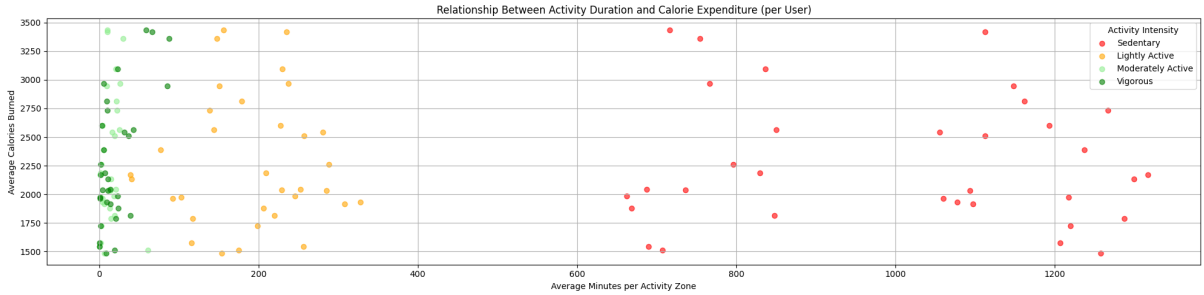

Figure 5: *Scatter plot of Multiple Linear Regression model of the average time spent in each activity zone and the average calorie expenditure.*

- **Figure 5** presents a scatter plot illustrating the distribution of user trends. Sedentary activity (red dots) consistently shows the longest duration combined with the lowest calorie expenditure.
- To better understand the relationship within each activity zone, individual subplots with regression lines are displayed in **Figure 6**.

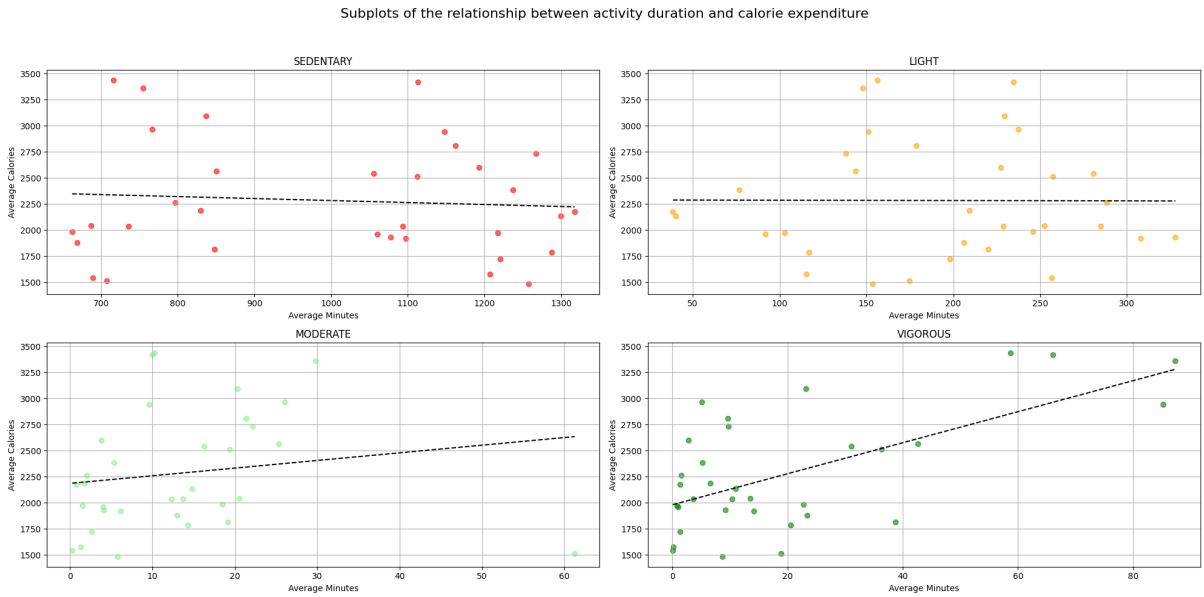

Figure 6: *Subplots of Scatter plot of Multiple Linear Regression models with regression line.*

- The most notable trend is that a user in the sedentary zone may spend approximately *1300 minutes (21 hours)* to burn 2,250 calories, whereas only about *30 minutes* of vigorous activity can burn the same amount.
- The dotted regression lines reveal a steeper negative slope for vigorous activity, indicating higher efficiency in calorie expenditure, while the sedentary activity shows an almost flat slope, reflecting minimal impact on calorie burn regardless of time spent.

5 Recommendations to Bellabeat

Increasing Bellabeat user engagement requires promoting higher physical activity levels, as greater device usage correlates with more active behaviour. Thus, Bellabeat needs to develop targeted strategy towards the following key trends-

i. How does each user fair against rest of the users?

- Giving each user a visualisation such as the above plot is likely to be effective to increase their activity levels.
- On the other hand, Bellabeat could also provide plots per day of the week, encouraging the user to be more active in the following day.
- You could also give feedback in the form of ranking or badges for reaching a certain goal.

ii. Identify the least active users!

- Least active users are identified by the time spent on the device using *'Step Goal'*.
- Notify them of their current levels of physical activity, preferably with data visualisations. Furthermore, send them regular alerts to move.

iii. Send the users a personalised goal

- Based on the users' activity zone, Bellabeat can send them trageted goals of step count per day with an informative message. For example, *"CDC recommends an average of **7500** steps per day for healthy living.(Refer to Article 2 for more information)."*
- Step goal recommendations are based on CDC Guildelines, along with which the users can also receive related articles which are attached below in References.

6 Conclusion

- Understanding trends in physical activity is essential for developing effective strategies to increase smart device usage.
- While analysing additional datasets could yield further insights, this project focuses on activity zones, daily step counts, and average calorie expenditure.
- Based on the data analysis, I have also provided evidence-based recommendations to support and enhance user engagement.

7 References

- Bellabeat Website.
- How Many Steps a Day Is Considered Active?
- Number of steps per day more important than step intensity.
- Daily steps and all-cause mortality.
- Adult Activity: An Overview.