Bellabeat Competitor Analysis

Analyzing Fitbit Tracking Trends For Competitive Insights

Analysis done by James Blackwell on February 21, 2022

Business Task:

The task set out for this case study is to analyze smart device usage to look for trends found in competing brands tracking data. By analyzing a group of 33 participants from a data set gathered by Fitbit devices, the goal is to find trends that can be used to impact the growth of Bellabeat from a marketing or product development standpoint. A recommendation is to be provided post analysis as to actions for improving the Bellabeat business as a whole.

Data Sources:

The data set used for analysis is a set collected by a group at RTI International. The data includes 18 tables which span across sleep activity, movement metrics and weight information. The movement metrics are recorded into several tables broken down by minutes, hours and days which combine together into summary tables. Should be noted that while the data set description claims 30 participants, there are in fact 33 unique user IDs.

Citation:
Furberg, R., Brinton, J., Keating, M., & Ortiz, A. (2016).
Crowd-sourced Fitbit datasets 03.12.2016-05.12.2016 [Data set]. Zenodo.
https://doi.org/10.5281/zenodo.53894

Data Change Log:

CREATED:

- Created a new worksheet titled Hourly_Activity combining Hourly_Steps, Hourly_Calories and Hourly_Intensities.
- Created a new worksheet titled Device_Usage by counting up daily entries for sleep, weight and activity data, and summed them into a column for device usage.
- Inside Hourly_Activity created a column 24 hour converting times to single out the hour.
- Inside Daily_Activity created a column Total Active Minutes combining Light, Fairly and Very Active Minutes.
- Inside Daily_Activity created a column Total Tracked Minutes combining Light, Fairly, Very and Sedentary Active minutes.

- Inside Daily_Activity created a column Calories Per Minute by dividing Calories by Total Tracked Minutes.

UPDATED:

- Copied Daily_Activity, Daily_Sleep, Weight_Log, Hourly_Intensities, Hourly_Steps, Hourly_Calories into a new workbook titled v01_Fitbit_Tracker_Data.

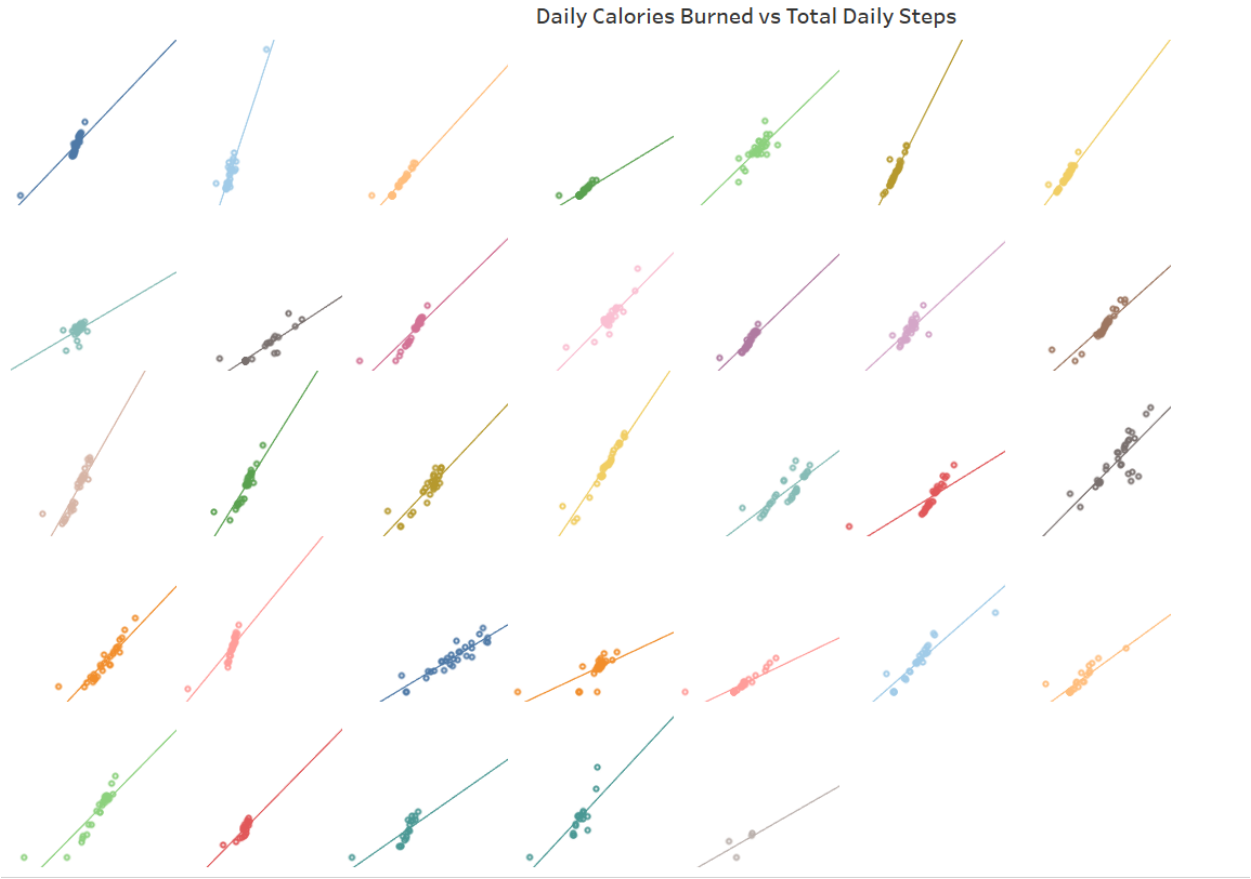
DELETED:

- Removed 3 duplicate rows from the Daily_Sleep_Table.

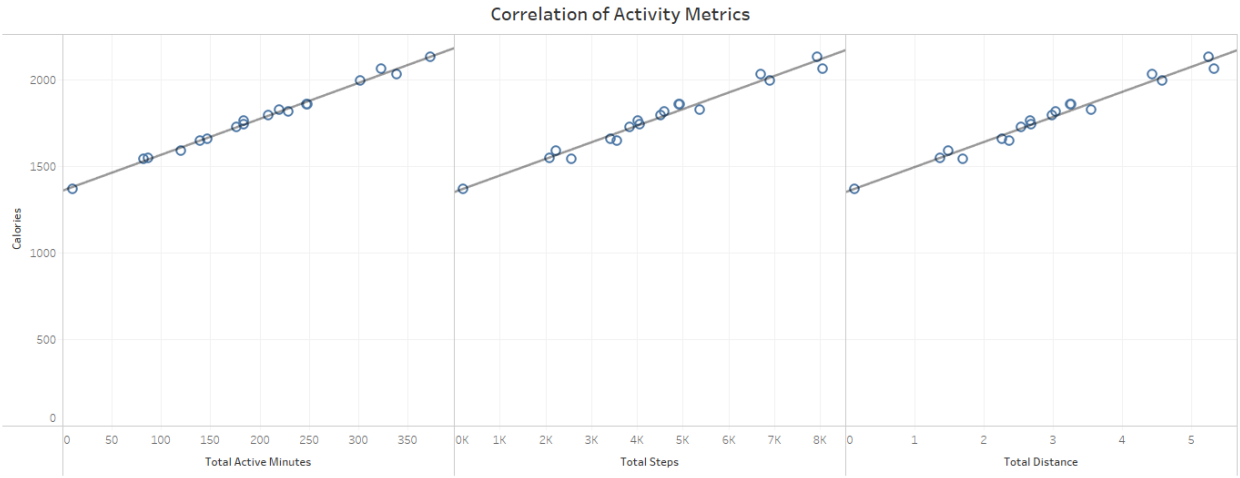
Summary of Analysis:

By first analyzing calories, intensity and steps vs hour over a 24 hour time period, I hoped to find trends for when people were the most active. Being the most prevalent feature of the watch I expected to see an interesting graph only to find that there was not much more of a story to it other than that people were mostly active between 8 AM and 8 PM. Not satisfied with this result I filtered my three graphs to an intensity level over 12, the average overall intensity, and found extremely interesting data. The new graphs spiked very hard at 5 AM and so I dug further into this by filtering my original data by 5 AM to see individual points for myself. To my surprise the spike came from a single ID with identical intensities and calories across 16 days in a 30 day period which more curiously had a step count of 0. Realizing I would need to investigate this further to determine if I had bad data, I began filtering various columns to analyze max and min values. When doing this I found weird results like the Id which had the highest steps and tracked distance measures burned half of the calories as the person with the highest calorie measure, who in turn had roughly half the distance and steps.With a lot of questionable data I first verified with the original data set to be sure I had not made any mistakes manipulating my data. Then I switched tools over to Tableau in order to visually see how these values affected the data. Looking first at daily calories burned vs total daily steps you can see how some users have data points correlated perfectly minus one or two bad data points, while other users have very poor correlation. Next, looking at a graph with total active minutes, total steps, and total distance all plotted versus calories; you can see how well all three measures correlate to each other when compared to calories burned. A single page with all 33 users plotted in this same way shows how the correlation to calories in all three graphs is either extremely correlated or very poorly correlated. Then when creating a new plot comparing total active minutes to calories burned per minute you can see that there is no correlation at all with a value of .14 for the r squared value. Finally, as for the other two tables regarding weight loss and sleep, there are not enough data points for a representative analysis other than an observation that both of these features were far less used than the activity.

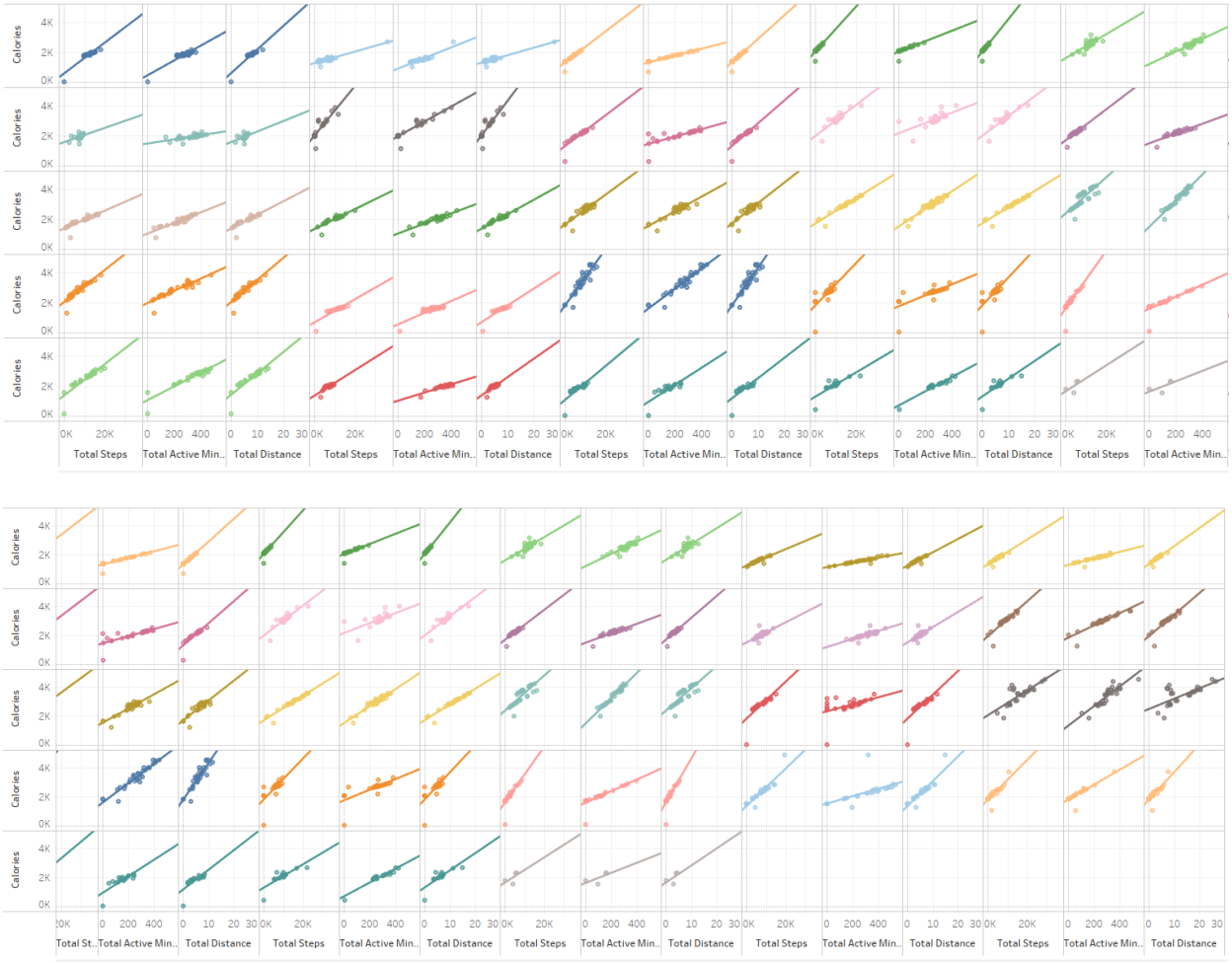
Supporting Visuals:



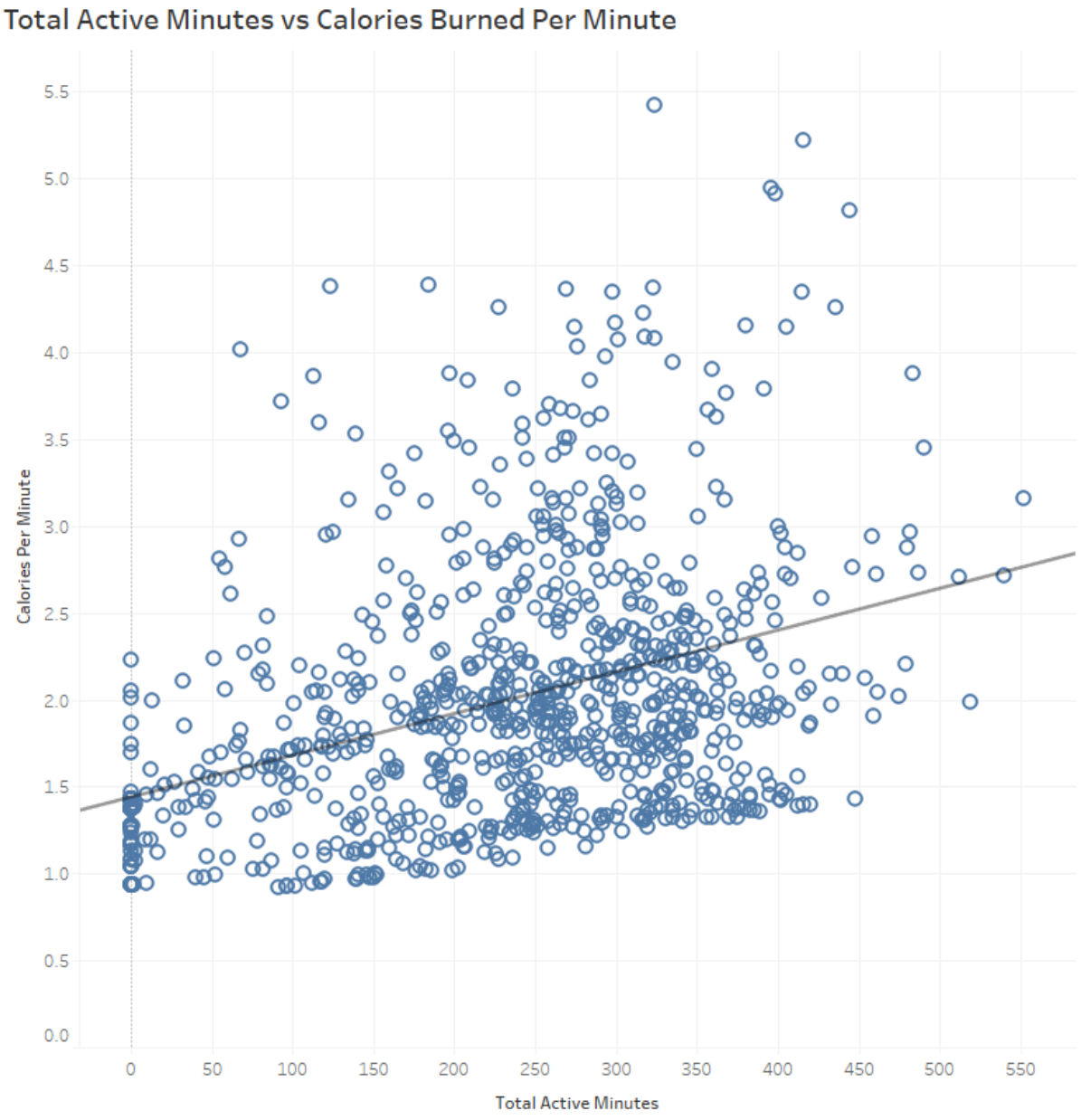
This is the visual for which you can see how some users data correlates well and others have poor correlation.



This next visual shows how for a single user when one metric correlates well with calories the other measures tend to correlate in the same way.



From this visual of the previous visual expanded to show every ID you can see how all three measures correlate similarly and how there are a lot of users with poor data.



From this final visual you can see how there is no correlation at all between total active minutes and calories burned per minute.

Key Findings:

My key observations are that first the data needs to be examined on how data was actually collected in more detail because otherwise the data is bad and not useful for analysis. On the chance that this data came directly from the smart devices themselves, it is clear that some users' data more accurately collected their metrics than others. Possible causes of this

could be how the device was worn, how tightly the device was worn, how the devices uploaded data that was collected while the device was offline, or a number of other causes.

Recommendations:

As for my recommendations for Bellabeat and the company, I would look at internal product data in order to see if Bellabeat products share a similar problem. In the case that Bellabeat products more accurately track activity metrics and calories burned than this can be used as a marketing opportunity for having the most precise smart devices on the market. From the given data I would also do some market research into the value of sleep trackers or weight trackers as in this data they were not popular features.