

Bellabeat health tracker Analysis Report

Date: 17 July 2022

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Business task statement

Identifying trends by analyzing smart device data to understand how users use these smart devices and applying these trends to a bellabeat product to get an idea about how bellabeat customers use their devices, and how these insights will influence bellabeat marketing strategy, and help reveal more opportunities for growth.

Data sources used :

FitBit Fitness Tracker Data by MÖBIUS (Kaggle)

This dataset was generated by respondents to a distributed survey via Amazon Mechanical Turk between 03.12.2016-05.12.2016. Thirty eligible Fitbit users consented to the submission of personal tracker data, including minute-level output for physical activity, heart rate, and sleep monitoring.

<https://www.kaggle.com/datasets/arashnic/fitbit>

Technologies used : SQL, R, Tableau

Cleaning documentation :

- Cleaning documentation.pdf

Date : 5/5/2022

- I saved a new table `activity_daily_important_cols_05_05_2022_V01` that does not contain 3 columns (TrackerDistance, LoggedActivitiesDistance, SedentaryActiveDistance) that decreased the number of columns from 15 to 12 compared to the original table `activity_daily`.
- I Updated `activity_daily_important_cols_05_05_2022_V01` table by rounding numbers to 2 decimals in the following 4 columns `TotalDistance`, `VeryActiveDistance`, `ModeratelyActiveDistance`, `LightActiveDistance`.

Date : 6/5/2022

- I cleaned column names (convert it to snake case)
`activity_daily_cleaned__06_05_2022_V01.01.csv` , `calories_daily_cleaned_06_05_2022_v01.csv`

Date : 7/5/2022

- I Removed Fat columns, 97% of entries are NA that decreased number of columns from 8 to 7 columns `weight_daily_cleaned_07_05_2022_v01.csv`
- I cleaned column names (convert it to snake case) `weight_daily_cleaned_07_05_2022_v01.csv`
- I removed 3 duplicate rows that decreased number of rows from 413 to 410

[sleep_daily_cleaned_07_05_2022_v01.csv](#)

- I added 2 columns [total_hours_asleep](#) , [total_hours_in_bed](#) (number of minutes / 60) that increased number of column from 7 to 9 columns [sleep_daily_cleaned_07_05_2022_v01.csv](#) Date : 8/5/2022

- I changed column sleep_day from Datetime to Date [sleep_daily_cleaned_08_05_2022_v02.csv](#)

- I joined part of [activity_daily_important_cols_05_05_2022_V01](#), and all columns [sleep_daily_cleaned_08_05_2022_v02.csv](#) new table is [activity_sleep_daily_joined_08_05_2022_v01.csv](#)

- I cleaned [activity_sleep_daily_joined_08_05_2022_v01.csv](#) and selected rows that has no NULL values new table is [activity_sleep_daily_joined_not_null_08_05_2022_v02.csv](#)

- I changed column date from Datetime to Date [weight_daily_cleaned_08_05_2022_v02.csv](#)

- I joined the new table [activity_sleep_daily_joined_08_05_2022_v02.csv](#) and [weight_daily_cleaned_08_05_2022_v02.csv](#) the new table is [activity_sleep_weight_daily_joined_08_05_2022_v02.csv](#)

Change Log : ■ [Change_log.pdf](#)

**this file contains the notable changes to the project

Version 00 (02.05.2022)

NEW

- Created new folders for (Activities, Calories, heartrate, intensities, MET, sleep, steps, weight) and moved their corresponding sheets inside each one of them.
- Combined minutes, hourly, daily data in one xls file (if possible) new xls files:
 - *Calories_hourly_daily*
 - *Intensities_hourly_daily*
 - *sleep_min_daily*
 - *steps_min_hourly_daily*

Changes

- Rename xls-csv files
 - weightLogInfo_merged → New name = *weight*
 - minuteMETsNarrow_merged → New name = *MET_min*
 - minuteIntensitiesNarrow_merged → New name = *Intensities_min* All of

them xls files Version 01.0 (05.05.2022)

NEW

- Created a new table *activity_daily_important_cols_05_05_2022_V01* that does not contain 3 columns from the original table *activity_daily*. Removed columns (*TrackerDistance*, *LoggedActivitiesDistance*, *SedentaryActiveDistance*) more than 90% of their values are 0.

Changes

Table name *activity_daily_important_cols_05_05_2022_V01*

- Rounded numbers (FLOAT) to 2 decimals in 4 columns
 - *TotalDistance*,
 - *VeryActiveDistance*,
 - *ModeratelyActiveDistance*,
 - *LightActiveDistance*

Version 01.0 (06.05.2022)

NEW

- Created two new tables
 - **activity_daily_cleaned__06_05_2022_V01.01.csv**
 - *calories_daily_cleaned_06_05_2022_v01.csv* their column names are in snake case.
- path : Data/cleaned_data

Version 01.0 (07.05.2022)

NEW

- Created two new tables
 - *weight_daily_cleaned_07_05_2022_v01.csv*
 - *sleep_daily_cleaned_07_05_2022_v01.csv* their column names are in snake case.
- Added 2 new columns to show number of hours by calculating (number of minutes / 60)
 - *total_hours_asleep*
 - *total_hours_in_bed*

Changes

- Removed *Fat* column (97% NA) from *weight_daily_cleaned_07_05_2022_v01.csv*
- Deleted 3 duplicate rows from *sleep_daily_cleaned_07_05_2022_v01.csv*

Version 02.0 (08.05.2022)

NEW

- Joined part of *activity_daily_important_cols_05_05_2022_V01*, and all columns *sleep_daily_cleaned_08_05_2022_v01.csv* new table *activity_sleep_daily_joined_08_05_2022_v01.csv*
- Removed NULL values from *activity_sleep_daily_joined_08_05_2022_v01.csv* new table *activity_sleep_daily_joined_not_null_08_05_2022_v02.csv*
- Joined the new table *activity_sleep_daily_joined_08_05_2022_v02.csv* and *weight_daily_cleaned_08_05_2022_v02.csv* the new table is *activity_sleep_weight_daily_joined_08_05_2022_v02.csv*

Changes

- Changed column *date* from **Datetime** to **Date** new table *weight_daily_cleaned_08_05_2022_v02.csv* 2

Analysis Summary and visualizations:

■ Analysis Summary .pdf

Sample size: 30-34 users

Confidence level: 95%

Margin Of Error: 17.9

Main key findings: 67% of bellabeat users have unhealthy sleeping habits (patterns) and they can be the target audience for the next campaign(**there is an opportunity for growth) more details can be found in recommendation section

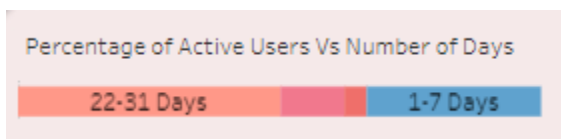
1- Total number of users is 34 Users

2- only 24 Users has records (Active Users)

***in the following analysis I analyzed data for active users only (24)



3- Active Users represent 71% of Total Users and non-active users represent 29%.



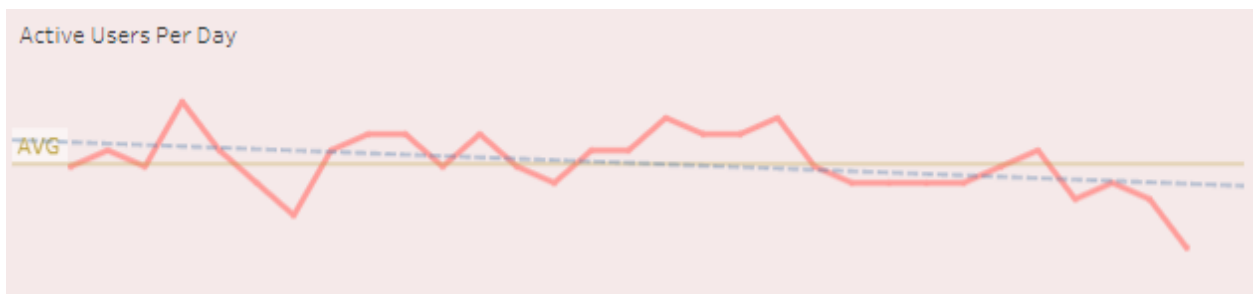
4- 67% of users use their devices more than 8 days/month

5- 33% of users use their devices less than 8 days/month (1-7 1 Days)

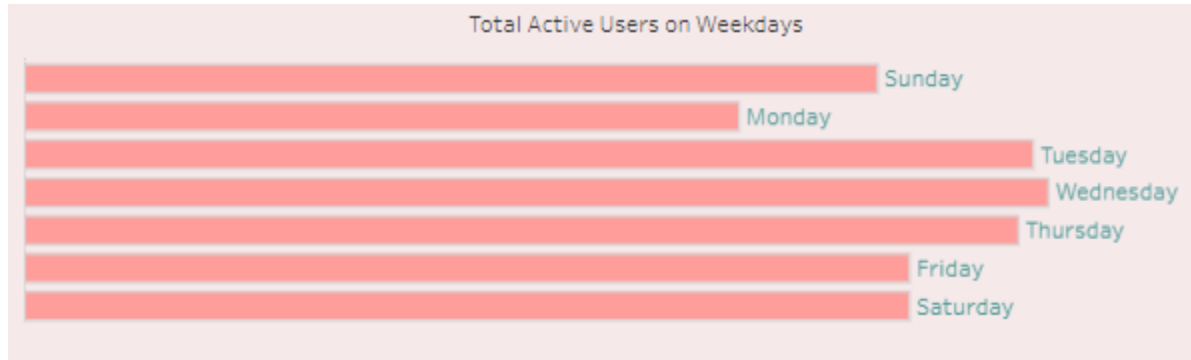


6- 21% of users logged their weight.

7- 79% of users did not log their weight.



8- the number of active users starts increasing from mid month (11th of the month) and start decreasing when reaching the end and the beginning of the month (we need more data to confirm this pattern)



9- According to hypothesis testing there's no association between number of users and weekdays however from charts we can see that there are more users on tuesday, wednesday and thursday than any other day of the week.

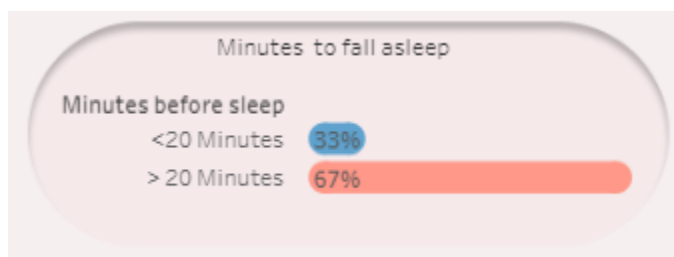


10- 75 % of users burn more than 2000 calories (2000 - 3500 normal to active)



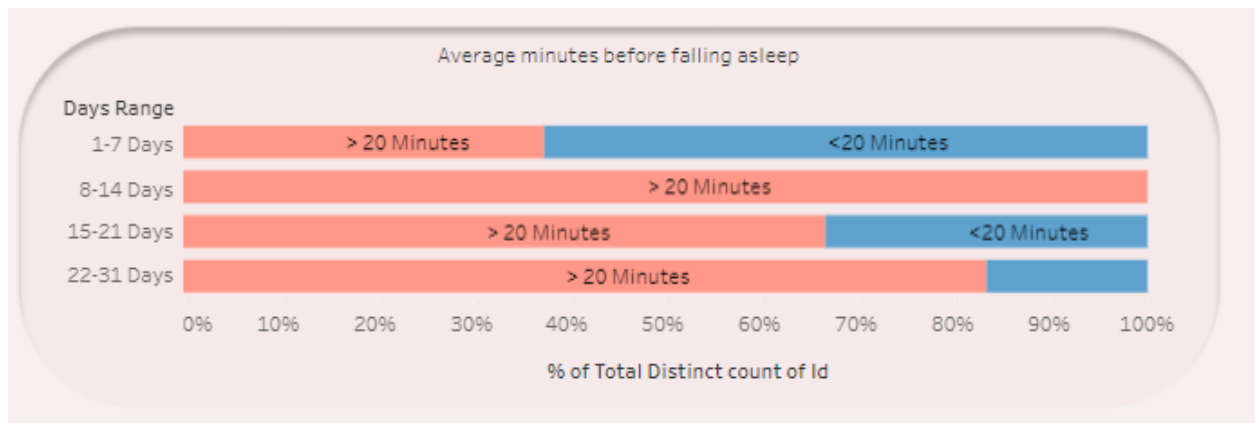
11- 54% of users sleep less than 7 hours (recommended sleeping hours 7h/day)

12- 46% of users sleep more than 7 hours (normal)

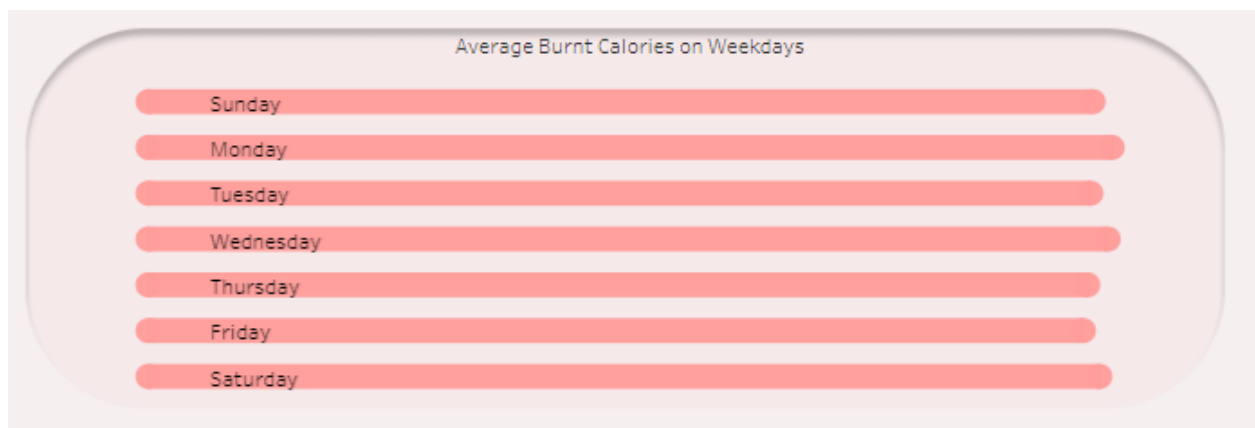


13- 67% of users take more than 20 minutes to fall asleep (normal time 5-20 minutes)

14- 33% of users take less than 20 minutes to fall asleep (normal)



15- users who use the device for more than 8 days tends to have more time falling asleep



16- average burnet calories per day is not associated with weekdays (it is mostly the same all week long)

Recommendations

I recommend that in the next marketing campaign posts should mainly focus on mental and physical wellbeing and how users can benefit from subscribing (only for 9.99\$ per month) to **Bellabeat Wellness Coach** that has a library that contains books, articles and videos about meditations and exercises to help users have quality sleep and reduce insomnia that might cause anxiety. Users can follow guided meditations before going to sleep, this will help them reduce time taken to fall asleep.

By maintaining good sleep habits they will increase productivity and protect their mental and physical health which is the main goal of designing bellabeat health trackers.

Target audience : users who use Bellabeat devices more than 8 days and take more than 20 minutes to fall asleep represent 67% of Bellabeat active users.