Lai Jien Weng

reallyhat@gmail.com

How Can a Wellness Technology Company Play It Smart?

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Overview

Bellabeat, a high-tech manufacturing products for women is a successful small company, but they have the potential to become a global smart device market. Urška Sršen, co-founder and Chief Creative Officer of Bellabeat, believes that analyzing smart device fitness data could help unlock new growth opportunities for the company. I am eager to find out the insights of how consumers are using their smart devices by analyzing Bellabeat's available data.

Problem Statements

1. What are the sleeping patterns of FitBit's users?
2. How are FitBit's users' sleeping quality distributed?
3. How are FitBit's users' heart rate distributed?

Goals

1. **Increase Bellabeat's sales:** By analyzing the available data by Bellabeat, we want to discover trends and insights to develop targeted marketing strategy accordingly.
2. **Explore growth opportunities:** Discover the market that have high demand, which Bellabeat could possibly expand in their products line.

Specifications

This section will propose and discuss the technical issues and specifications in detail.

Dataset

- FitBit Fitness Tracker Data (CC0: Public Domain, dataset made available through Mobius):

  This Kaggle data set contains personal fitness tracker from thirty fitbit users. Thirty eligible Fitbit users consented to the submission of personal tracker data, including minute-level output for physical activity, heart rate, and sleep monitoring. It includes:

  - Daily activity
  - Steps
  - Heart rate

This dataset was generated via Amazon Mechanical Turk between 03.12.2016 - 05.12.2016 (2 Months). We can verify the validity of the dataset by navigating through this website.

Data Preparation:

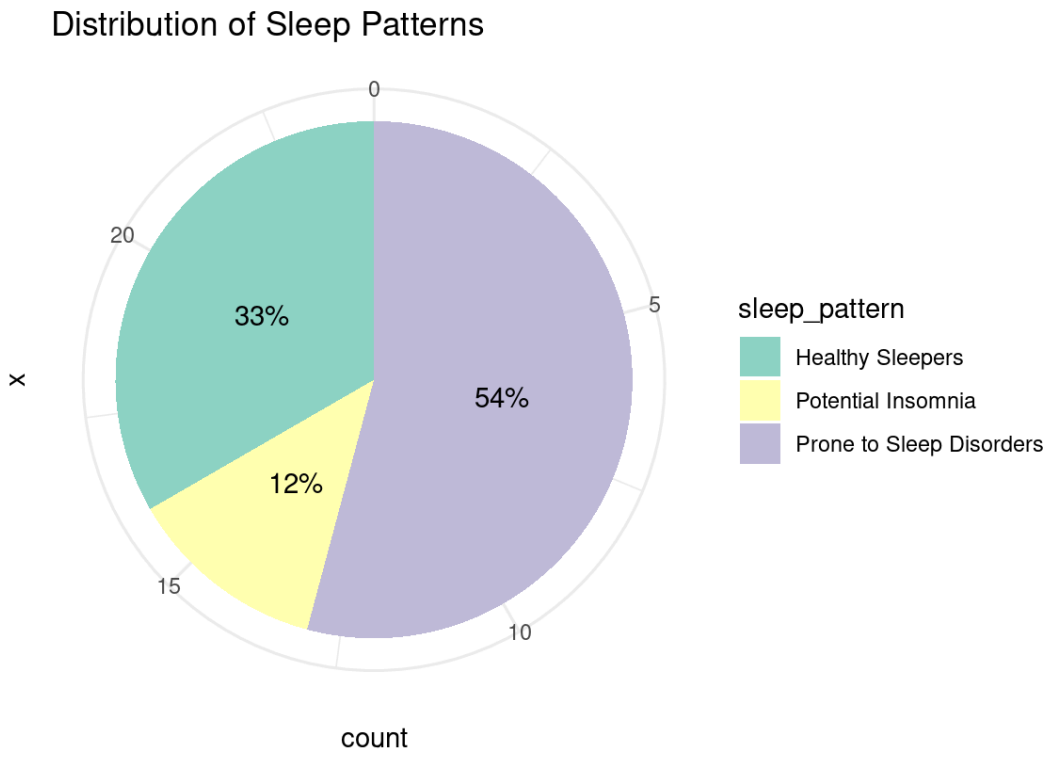
This phase discusses how we clean and prepare the raw data.

1. First, we clean the raw dataset by checking for missing values and duplicated data.
2. Then, we remove any inconsistencies and ensure the data is formatted correctly for analysis.

Analysis and Insights

This phase discusses how we will analyze the data to derive meaningful insights.

Sleep Pattern Distribution



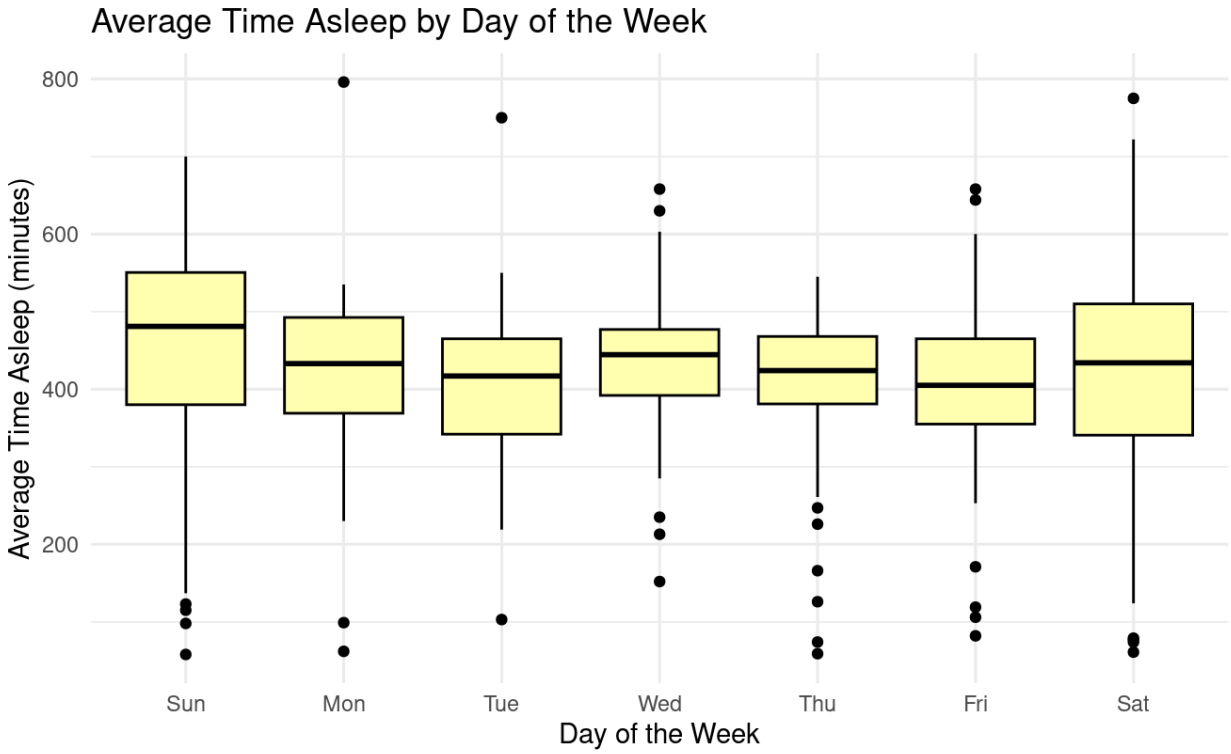
Based on the pie chart, we have classified sleep patterns into three categories using the Multiple Sleep Latency Test (MSLT) results:

- **Healthy Sleepers (33%)**: Individuals who consistently fall asleep in less than 20 minutes. About one-third of the sample maintains good sleep hygiene.
- **Prone to Sleep Disorders (54%)**: The largest segment, taking 20 to 50 minutes to fall asleep during at least one nap, indicating a significant portion of users experiencing or at risk of sleep disorders.

- **Potential Insomnia (13%)**: Individuals who consistently take more than 50 minutes to fall asleep.

The majority of users are prone to sleep disorders, representing a significant market for sleep improvement solutions. Bellabeat could address this by developing products focused on enhancing sleep quality, such as sleep trackers with guided meditation features.

Average Time Asleep



- **Saturday & Sunday**:
  - Median sleep duration is relatively high, indicating variability in sleep duration.
  - The interquartile range (IQR) is broader, showing higher fluctuation in sleep duration.
- **Monday to Friday**:
  - Median sleep duration tends to be lower and more consistent compared to weekends.

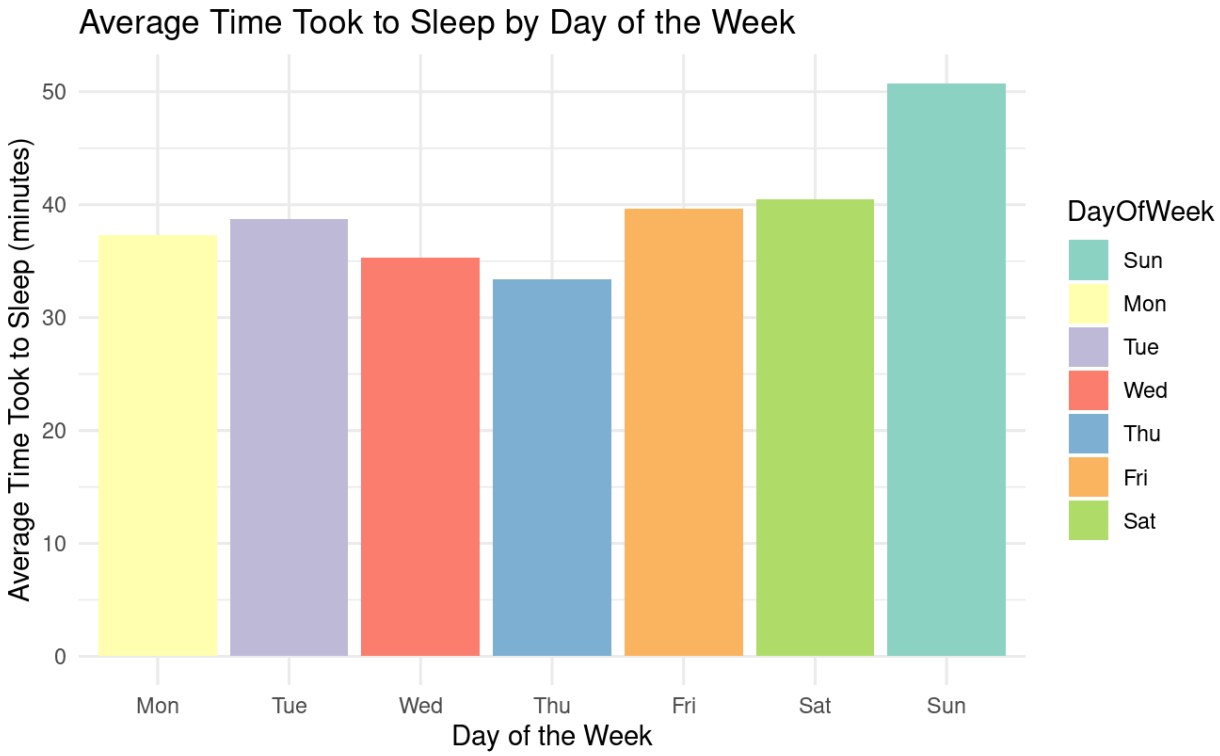
- The IQR is narrower, indicating higher consistency in sleep duration.

Several factors might contribute to the high sleep duration fluctuation on weekends:

- **Reduced Obligations**: With fewer work or school commitments, people may have more flexibility in their sleep schedules.
- **Sleep Debt**: Trying to compensate for weekday sleep deficits can result in longer sleep durations on weekends.

Understanding these trends, Bellabeat can introduce educational content such as articles, videos, and webinars focused on maintaining consistent sleep schedules, the health impacts of sleep, managing weekend activities, and creating sleep-friendly environments. This approach can improve user sleep habits, increase engagement, and strengthen brand loyalty.

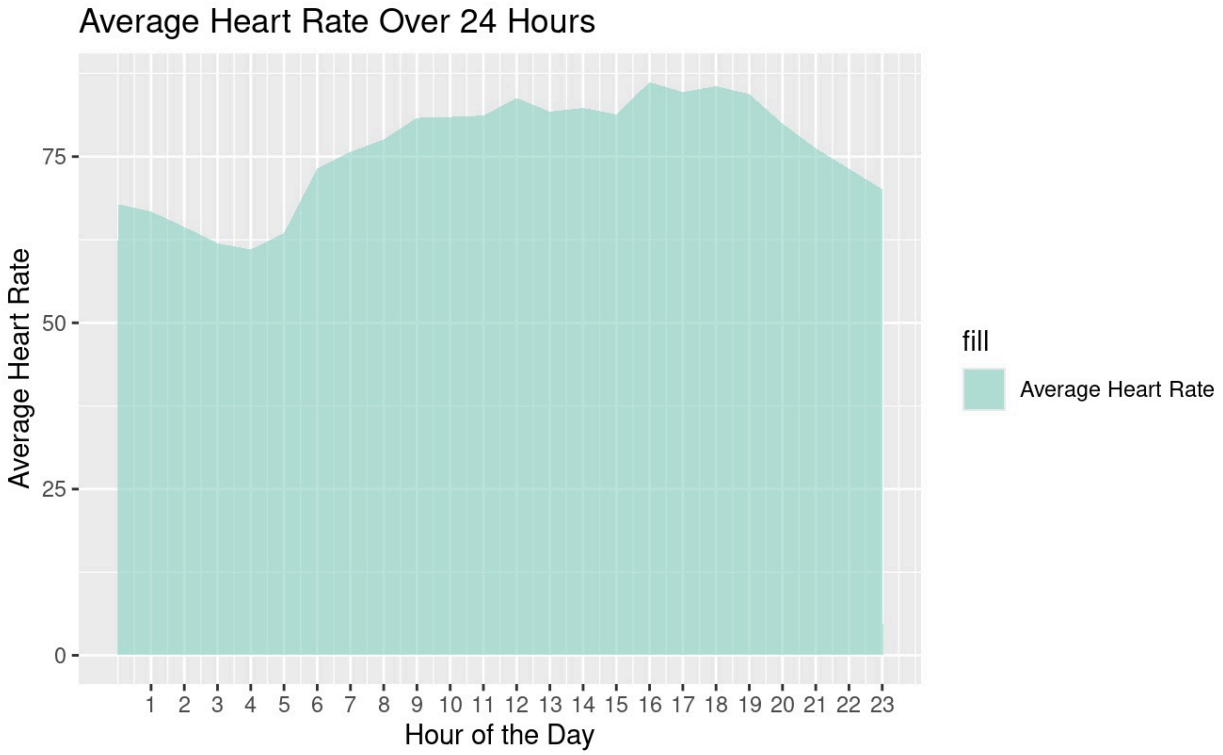
Average Time to Fall Asleep



- **Sunday (50 minutes)**: The highest average time to fall asleep occurs on Sunday, suggesting possible anxiety about the upcoming week.
- **Monday to Saturday (35-40 minutes)**: During the workweek, the time to fall asleep remains relatively stable, ranging from 35 to 40 minutes.

This data indicates that FitBit users may experience anxiety as they prepare for the week ahead. To address this, Bellabeat could introduce features like a guided wind-down routine specifically designed for Sunday nights, helping users reduce anxiety and improve sleep onset.

Heart Rate Analysis



- **Midnight**: The average heart rate is low, indicating restful sleep and high parasympathetic activity, which is crucial for recovery and overall health.
- **3:30 pm - 7:00 pm**: The average heart rate is high due to physical activities or exercise, reflecting a typical pattern of increased activity levels in the afternoon and early evening.

Anomaly Detection in Heart Rate

By analyzing heart rate data, we can also detect anomalies that may indicate health issues. For example, unusually high heart rates during sleep or sudden spikes can signal stress or medical conditions, including potential cardiac events such as heart attacks.

To enhance user safety, Bellabeat could implement a feature that monitors heart rate continuously and triggers an alert if an abnormal heart rate is detected. In severe cases, where the heart rate indicates a critical condition, the device could automatically initiate an emergency response, such as calling an ambulance.

By identifying these anomalies and responding promptly, Bellabeat can provide significant value to users, not only in terms of wellness monitoring but also in life-saving emergency support. This enhancement would further establish Bellabeat as a leader in the wellness technology market, emphasizing its commitment to user health and safety.

Key Findings and Actionable Insights

Sleep Patterns

Key Findings:

- Users can be classified into three groups: Healthy Sleepers (33%), Prone to Sleep Disorders (54%), and Potential Insomnia (13%).

Actionable Insights:

- **Tailor Recommendations**:
    - **Healthy Sleepers (33%)**: Provide content to help maintain their good sleep habits. Encourage routine check-ins to reinforce their positive behaviors.
    - **Prone to Sleep Disorders (54%)**: Offer personalized recommendations and tools such as relaxation techniques, sleep hygiene tips, and stress management strategies.
    - **Potential Insomnia (13%)**: Suggest professional consultations and provide advanced sleep tracking features to monitor and improve sleep health.
- **Personalized Consultation**: Develop a service that offers personalized consultations based on user sleep data. This could include virtual consultations with sleep experts or personalized reports that provide actionable steps to improve sleep quality.

Time Asleep

Key Findings:

- Sleep duration is inconsistent, with higher variability on weekends, indicating lower overall sleep quality.

Actionable Insights:

- **Introduce Aromatic Devices**: Develop products such as aromatic diffusers with calming scents like lavender, which can aid in improving sleep quality, especially for users suffering from insomnia.
- **Promote Sleep Education Content**: Create and distribute educational content focused on the importance of consistent sleep schedules, the health benefits of quality sleep, and strategies for maintaining good sleep hygiene. This could include articles, videos, and webinars.

Time Took to Sleep

Key Findings:

- Users take longer to fall asleep on Sundays, indicating potential anxiety about the upcoming week.

Actionable Insights:

- **Introduce Guided Meditation Features**: Integrate guided meditation sessions into Bellabeat devices to help users relax and fall asleep faster. Tailor these sessions to address anxiety specifically related to the upcoming week. This could involve mindfulness practices, breathing exercises, and relaxation techniques designed to ease pre-sleep tension.

Heart Rate

Key Findings:

- Heart rates are lowest during midnight, indicating restful sleep. Highest heart rates are observed between 3:30pm and 7:00pm, likely due to physical activities.

Actionable Insights:

- **Alert Users of Abnormal Heart Rates**: Develop features that monitor heart rate continuously and alert users to any anomalies that may indicate health issues such as

potential heart attacks. This feature could be coupled with an option to contact emergency services if a severe abnormality is detected.

- **Promote Consistent Physical Activity**: Encourage users to engage in regular physical activities through reminders and challenges. Provide personalized exercise plans based on user activity data to promote cardiovascular health and overall fitness.

Contact Information: Lai Jien Weng
Email: reallyhat@gmail.com
Phone: +60 16-385 9710