**Bellabeat Case Study: A Data-Driven Marketing Analysis**

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**Executive Summary**

This report presents a comprehensive data analysis of smart device usage to identify new growth opportunities for Bellabeat, a high-tech manufacturer of health-focused products for women. By following the Ask, Prepare, Process, Analyze, Share, and Act phases of the data analysis process, this study uncovers key user behavior trends and provides high-level recommendations to inform Bellabeat's marketing strategy.

The analysis, conducted on publicly available Fitbit fitness tracker data, reveals that a majority of users are highly sedentary, averaging over 17 hours of inactive time per day. Furthermore, average daily steps fall below public health recommendations, and engagement with advanced features like weight logging is low.

Based on these findings, the report recommends that Bellabeat's marketing strategy should pivot to target this large segment of sedentary users. It should focus on promoting the benefits of light activity, introducing gamification to boost engagement, and enhancing key app features to better serve customer needs.

**1. Ask: Business Task & Stakeholders**

**Business Task**

The business task is to analyze smart device usage data from non-Bellabeat users to identify trends and insights. The goal is to apply these insights to a Bellabeat product and provide high-level marketing strategy recommendations to the Bellabeat executive team.

**Key Business Questions**

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

**Key Stakeholders**

* **Urška Sršen**: Bellabeat's cofounder and Chief Creative Officer.
* **Sando Mur**: Bellabeat's cofounder and a key member of the executive team.
* **The Bellabeat marketing analytics team**: The team responsible for guiding Bellabeat's marketing strategy.

**2. Prepare: Data Source & Evaluation**

**Data Source**

The primary data source for this analysis is the "FitBit Fitness Tracker Data" (CC0: Public Domain) from Kaggle. This dataset, collected via Amazon Mechanical Turk, contains personal fitness tracker data from 30 Fitbit users over a two-month period (March-May 2016). It includes data on daily activity, steps, and weight logging.

**Data Credibility (ROCCC)**

The data was evaluated using the ROCCC framework to understand its limitations:

* **Reliable**: The data is from a limited sample of users and is not representative of Bellabeat's target audience of women.
* **Original**: It is a third-party, publicly sourced dataset, not a first-party source directly from Bellabeat.
* **Comprehensive**: The data is limited, with key demographic information (age, gender) missing.
* **Current**: The data is from 2016 and may not reflect current smart device usage trends.
* **Cited**: The original source and methodology are not fully transparent.

**Key Finding During Preparation**

A critical finding during the preparation phase was that the activity and weight data were from two different, non-overlapping groups of users. As a result, a direct correlation between individual activity and weight change could not be analyzed. The analysis was adapted to study these two data sources independently.

**3. Process: Data Cleaning & Manipulation**

**Tools Used**

MySQL Workbench was chosen as the primary tool for data processing due to the large size of the data files, which were incompatible with spreadsheet programs.

**Data Cleaning Steps**

1. **Import**: The dailyActivity\_merged and weightLogInfo\_merged files from two different folders were imported into separate tables.
2. **Consolidate**: UNION ALL queries were used to combine these separate tables into two single, comprehensive tables: daily\_activity\_combined and weight\_log\_combined.
3. **Identify Duplicates**: Queries with GROUP BY and HAVING COUNT(\*) > 1 were run on both combined tables, and duplicate rows were identified.
4. **Remove Duplicates**: To handle the duplicates, a new, clean table was created for each dataset by using GROUP BY with aggregate functions (MAX) to consolidate the data into a single, accurate row per user per day.
5. **Finalization**: The original tables were dropped, and the clean tables were renamed to ensure all subsequent analysis was performed on accurate, duplicate-free data.

**4. Analyze: Summary of Findings**

Your analysis uncovered three major trends in user behavior, supported by the following queries:

1. **High Sedentary Behavior**:
   * **Query**: SELECT ROUND(AVG(SedentaryMinutes), 2) AS avg\_sedentary\_minutes FROM daily\_activity\_combined;
   * **Result**: The average user spends **1067.78 minutes (over 17 hours)** per day in a sedentary state.
2. **Below-Average Activity Levels**:
   * **Query**: SELECT ROUND(AVG(TotalSteps), 2) AS avg\_daily\_steps FROM daily\_activity\_combined;
   * **Result**: The average daily step count is **6672.84**, falling short of the 10,000-step recommendation.
3. **Low Engagement with Advanced Features**:
   * **Query**: SELECT Id, COUNT(Date) AS log\_count FROM weight\_log\_combined GROUP BY Id ORDER BY log\_count DESC;
   * **Result**: Of the 13 users who logged their weight, the majority did so only a few times throughout the two-month period, indicating low and inconsistent engagement.

**5. Share: Supporting Visualizations & Key Insights**

The following visualizations were created in Tableau to support the key findings and provide a clear story.

**Visualization 1: User Activity by Time of Day**

This stacked bar chart visualizes the proportion of time users spend in different activity levels. It clearly shows the dominance of sedentary minutes over all other forms of activity.

**Visualization 2: Average Steps Per Day of the Week**

This bar chart displays the average steps taken each day of the week. It highlights that user activity is somewhat consistent throughout the week, with a slight peak on Saturday, suggesting an opportunity to capitalize on weekend trends.

**Visualization 3: Weight Logging Frequency**

This bar chart, sorted in descending order, demonstrates the low engagement with the weight-logging feature. The visualization shows that the most frequent loggers only logged their weight a handful of times.

**6. Act: Final Conclusion & Recommendations**

**Final Conclusion**

The analysis reveals that a typical smart device user is largely sedentary, is not meeting recommended daily activity goals, and has low engagement with features like weight logging.

**Actionable Recommendations for Bellabeat's Marketing Strategy**

1. **Shift Focus to Sedentary Users**: Instead of exclusively targeting highly active individuals, Bellabeat should launch a new marketing campaign aimed at the large segment of sedentary users. The message should be about making small, achievable lifestyle changes.
2. **Incorporate Gamification**: To address low daily steps and user retention, Bellabeat should introduce gamified features in its app. This could include daily "Step Streak" challenges, badges for milestones, or social leaderboards to encourage consistent use.
3. **Enhance and Promote Key Features**: Bellabeat should invest in improving the user experience for features like weight logging. Marketing should highlight the benefits of consistent data tracking and provide incentives for users to engage with these features more frequently.

**Next Steps for Stakeholders**

* **Marketing Team**: Launch a new digital marketing campaign targeting sedentary users, highlighting the benefits of light activity and how Bellabeat products can help.
* **Product Development Team**: Redesign the app to include gamification features and a more engaging experience for logging weight and other metrics.
* **Data Analytics Team**: The primary limitation was the separate user groups for activity and weight data. The next step would be to find a more comprehensive dataset that includes both activity and weight data from the same users to conduct a deeper analysis.

**1. Average Daily Activity Levels**

Find the average minutes users spend in different activity levels. This will show you if users are primarily sedentary or active.

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**2. Average Steps and Calories Per Day**

Calculate the average steps and calories burned per day for all users.

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weight

**1. Logging Frequency**

Calculate how many times each of the 13 users logged their weight to understand their engagement levels.

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**2. Average BMI**

Calculate the average BMI for the users who logged their weight.

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