Data Driven Insights for Bellabeat Marketing Strategy

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***Abstract*— The current case study explores the possibility of using valuable data to develop Bellabeat, a technology firm that deals with wellness, as well as to bolster its marketing operations. The given analysis rests upon the usage of Fitbit data on the activity of 30 people publicly available to determine their behavior patterns in daily activities, the overall sleep time, and the value of the BMI to make practical recommendations. The preparation and transformation of data along with its analysis on R programming led to the conclusion about the fact that the working audience has the tendency to be active in the 4-7 PM period, the users that do not lack sleep (6-8 hours) also expressed a higher activity rate, and the BMI of an average user was a little bit higher than the healthy one. The trends imply that one can interact individually with personal coaching alerts, sleep coaches, and weight controllers. Founding on these conclusions, a line of suggestions were developed on how the Bellabeat app experience could be enhanced and the ability to develop marketing campaigns on a more personal basis. The short-term goals will be push notifications, which will be sent at the optimal time of a day, gamification of step completion, dedicated wellness challenges, and educational content on the topics of healthy sleep and BMI. Data-driven decision-making as the research demonstrates is potentially capable of helping Bellabeat to form healthy routines among the users as well as support the products usage and brand loyalty.**

I. INTRODUCTION

Bellabeat is a health technology company that manufactures smart devices and tracking apps that allow women to make healthful choices. Since the amount of products is still growing with the Leaf health tracker, Time smartwatch, Spring smart water bottle, and Bellabeat mobile app, the firm has an opportunity to turn people into empowered users having processed and wisely concluded information on their daily routine.

To be able to stay competitive in the health-tech market environment and to create a higher user engagement level, Bellabeat has the opportunity to consider the possibility of introducing data analytics to guide its marketing and product strategy. The case study is a real business scenario, in which the firm would like to understand the information regarding the interaction between the users and the wellness equipment and how the behavioral patterns could be exploited in generation of strategic decisions.

The study examines the physical activity patterns, sleep duration as well as body composition to support a set of Fitbit activity diaries of 30 participants. The expected outcome is to find relevant patterns and provide recommendations that Bellabeat can apply to individualize the user experience and promote a healthier behavior and develop more productive advertising campaigns.

II. BUSINESS TASK

Bellabeat aims to implement the data-driven innovative decision making, which is going to be optimized by the best engagement and user friendliness as part of its wellbeing ecosystem. You will approach the data of use of smart devices in your own manner: namely, you will discuss data regarding the use of wearable fitness trackers and on the basis of this practically you will recognize trends in the spheres of physical activity, sleep, and a wellness behavior.

The idea would be to translate these behavioural findings to solutions which would be in a position to:

Make the app wellness content personalised

Declare conscious marketing parade

Direct product value additions as retention and satisfaction of the user

Finally, analysis will assist Bellabeat to match its services with the users and become a known competitive term in the health-tech market. It is aimed at discovering the tendencies in physical activities, sleeping and the wellness behavior in general with the wearable devices data in the lead. Its outcome will be utilized to make decisions that will guide the design of tailor-made wellness related materials, tailor-made marketing programs and development of the products to suit the needs of the intended users and the capacity of competing with the others within the market. In order to make sure that Bellabeat simplifies its promotion plan and advances the engagement process of the users, it is essential to observe the utilization of the smart gadgets in order to determine the user behavior.

III. COMPANY BACKGROUND

Founded in 2013, an adventure business Bellabeat centers on wellbeing and is a combo of two business people an artist, entrepreneur, and a mathematician tech designer Urska Srgen, and Sando Mur. It is an American company with a significant overseas presence more so in the health-tech market. Bellabeat is focused on the production of luxurious, smart and data-driven products that use the potential of the information technology industry to help women take personal control over their physical and mental strength.

There are some innovative devices and services included in the product ecosystem offered by Bellabeat:

A. Leaf

A smart healthcare tracker which looks like fancy jewelry, fitted on a necklace or a bracelet or even a clip. It tracks acts, rest and stress and reproductive health and it synchronizes with Bellabeat app to gain real time so as to know the body better.

B. Time

A smartwatch with a hybrid display, a combination of a modern wellness device, combining the classic old-fashioned mouse with stress measures, step counter, and so on. Spring is an intelligent water bottle which may calculate a daily consumption of water and inform you that it is necessary to maintain yourself physically and hydrating successfully. Bellabeat App A proprietary code environment integrating all Bellabeat products that provides the customer with health data retailing, habit tracking, and personal coaching. There is also the premium subscription service of Bellabeat, where the company promises to provide users with access to personalized health coaches and other lifestyle information round the clock. This includes sleeping, feeding, mindfulness and physical exercise recommendations depending on wellness goals and trends of individuals. The presence of a powerful digital marketing strategy has also made Bellabeat more popular mostly based on the popular platforms of Instagram, Facebook, YouTube, and Google Ads. Data analytics also assists the company not only in terms of forming its campaigns, but also communicates with its audience on a regular basis, sending out an outreach of content and casting it in terms of branding as wellness-based. Its dream of embracing technology and design to provide people with a motive to live healthier lifestyles has been putting its money where its mouth is, by being innovative in its wearable wellness industry by making useful yet fashionable products.

IV. Dataset Overview

The given case study makes use of a publicly available dataset on Kaggle, named as Kaggle FitbitYes, which displays one-minute and overall daily data of 30 Fitbit participants. The volunteers provided their own personal data of fitness trackers, 31 days in total. Although the dataset is not extracted directly on Bellabeat devices, it is very relevant as there is similarity in both user goals and measures of wellness being tracked.

A. Key Components of the Dataset:

The data consists of several CSV files, where each of them describes an aspect of the user wellness behavior: label=•

- Daily Activity merged: Possessing cumulative steps, distance travelled, number of calories burnt and duration spent on various steps of activity (very active, lightly active, and sedentary).
- Sleep Day merged csv: Has the total minutes asleep in a day and time in bed by the user.
- Weight Log Info merged csv: It stores weight (kingk and pounds), body mass index, and fat percentage.

Other files (e.g., hourlySteps, minuteCaloriesNarrow) only contain more detailed data than the others and did not participate in this work.

B. Data Relevance:

this dataset was selected because it relates well to the areas of focus on product by Bellabeat in the areas of activity tracking, sleep trends, and body measures. This data can be used to understand some general user behavior that Bellabeat customers will have in common, which may be used in influencing marketing and product suggestions.

V. DTA CLEANING

A significant part of data preparation before the analysis of the Fitbit dataset was cleaning it. It was galled by the transformation and the standardization of data so that they could be used easily and effectively with regard to accuracy and consistency in the generation of behaviors insights. All cleaning procedures were carried out with the help of R programming with the use of tidyverse, janitor, and lubridate packages.

1) Standardized Column Names: Each data was also cleaned by creating its name to be readable and consistent snake case through
   `janitor::clean_names()`
2) Date Formatting and Parsing: These items that were made up of a date and time were in need of correction of formats that would help them to be joined together and operate with times and consequently the functions `lubridate::mdy ( ) and mdy _ h ms ( )` were used.
3) Duplicate and redundancy files compression: Correlation was also identified in the derivation of the weight and sleep logs especially to ensure there is no inflation of data with use of
   `distinct()`
   in computing repeats.
4) Handling Missing Values: Failing to report values in regards to such parameters as BMI and percent of fat was taken into account. The non-critical NAs only facilitated visualisations and the seeking summaries.
5) Concatenating of Data across Data Sources: To have a complete picture of each of the users of the daily measurements, all these individual sets (daily activity, sleep, weight logs) were combined matching, id and date columns.
6) Data Aggregation and Data Filtering: The most recent quantification of the BMI per user was used to analyse it and classified using group.by () in relation to the user: the stability of the analysis was studied using the weight log, slice (1).
7) Check Val and Struture: Finally, such datasets were tested with glimpse(), summary and View() in order to determine whether they were properly structured, complete and consistent when it came to important variables.

VI. INSIGHTS

A. What time of day are users most active?

Analysis of the number of data of Fitbit user activities revealed that the period when the overall physical activities of the users are high is when it is late in the afternoon and early in the night; that is, between 4.00 PM and 7.00 PM. The period is characterized by the most number of steps and

minutes of active movement. The tendency could be related to post working activity, which includes walking, exercising, or running errands by the users. The identified behavioral pattern can be identified by Bellabeat as beneficial, as it implies that the company will be able to fully engage the app users by timing app notifications, wellness challenges, or reminders, to the identified peak hours. The collaboration of digital communications with natural patterns of human activity can promote the success of Bellabeats wellness programs and encourage user-retention in the long term.

B. How many steps do users take on average?

According to the study of the daily data of the activity, Fitbit users perform about 6,565 steps in a day. This mean is under the universally recommended health standard of 10,000 steps in a day, which is usually linked to a good cardiovascular health and general body fitness. It was also found in the data that a notable percentage of users consistently miss this goal suggesting a possibility of Bellabeat to present new features that encourage more steps per day. With the help of the customized step target setting, motivational messages, challenges and rewards, Bellabeat will be able to motivate users to increase their activity at a steady pace and get used to healthier daily activities.

RECOMENDATIONS

Taking into account the ideas mentioned in the analysis of the data measuring the activity, sleep, and BMI, a number of specific recommendations achieve the conclusion that could be given to Bellabeat to improve its product line and marketing. First, there is the late afternoon to early evenings window (4-7 PM) when users are most active and Bellabeat should use this time to send motivational push notifications, reminders, or challenges initiated on the app so that it is most effect.

Second, the application needs to stimulate or encourage healthy sleeping patterns where users should ensure they get between 6 and 8 hours of sleep considering that their health activities are something that is related to that category. The latter can be done in the form of individual sleep monitoring, alarm prompts to go to bed, and wellness articles about sleep.

In addition, the mean number of steps per day (6,565 steps) is not very high; it may be used to gamify the app and motivate the users with the help of step competitions, virtual awards, group standings, etc. Also, since its average users range in BMI in the overweight bracket, Bellabeat will be in a position of incorporating educative content, weight monitors and weight-related goals to allow its users to maintain a more manageable weight.

Finally, it could be advised that these suggestions could be encouraged with some personalized advice and marketing statements as per the habitual behavioural patterns of the user that can be acquired through the ongoing mechanism of collecting and grouping data. This set of approaches will help to develop the health outcomes of the user, increase the rates of interaction with the applications, and turn Bellabeat into a more data-driven and need-sensitive wellness company.

CONCLUSION

The current short case study demonstrates that the evidence presented through data can help those wellness technology companies like Bellabeat better target the interests of customers and help them live healthier lives by making the necessary strategic choices using the data-driven approach invented. The statistical examination of data concerning users in the Fitbit, i.e., the patterns of alterations in the degree of physical activity and the period of sleep time, and the values of BMI that found their reflection in the Fitbit users data, assisted us in the calculation of some important behavioral patterns. It was noted that the most activity was observed among the users in evening, that they were more physically active when they left a time of 6-8 hours sleep and that they were almost at the slightly above the healthiest body mass index.

The recommendations were based on the results and included details like the wellness reminders, the content of sleep, the activity activity monitoring in the form of game, and the BMI-related advice depending on the person. Such strategies, accordingly, can make Bellabeat draw people, make their products more efficient, develop a long-term change in behavior, and make their products more loyal provided that these strategies are applied. In a nutshell, it is observed in this case study that the value of adopting certain degree of raw data into making sense will have close connection to the growth of business and human well-being.

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