Strava Fitness Data Analytics: PowerBI Insights Report

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OVERVIEW

In this project, we connected our PostgreSQL database directly to Power BI, enabling seamless, live integration with all key fitness datasets (daily activity, sleep, intensities, heart rate, weight log, and more). Using Power BI's robust visualization and DAX capabilities, we developed an interactive, multi-page analytics dashboard to uncover user behaviour, health patterns, and actionable business insights.

After connecting PostgreSQL and Power BI, I created a four-page interactive dashboard to visualize and analyze user fitness data from different angles. Each page is designed to highlight an important aspect of user behavior and health:

Summary: Provides key metrics and engagement data. It gives a quick view of overall user activity, retention, and health status.

Activity Trends: Looks at daily, weekly, and monthly step patterns, including seasonal changes and user activity cycles.

Health & Wellness: Offers insights into users' physical health. It covers heart rate distribution, sleep quality, weight trends, and BMI categories.

User Stats: Presents detailed comparisons among individual users. It features leaderboards, frequency segments, and personal health and activity data.

These pages together provide a complete and useful view of the user base. They help with making informed decisions and engaging users effectively.

INSIGHTS

1. **SUMMARY DASHBOARD**
    - High Activity Rate: 76% of users consistently meet or exceed the recommended 10,000 daily steps, indicating strong engagement with activity goals.
    - Declining Activity Trend: User activity dropped by nearly 50% from April to May, signaling potential seasonal effects, motivation dips, or retention challenges.
    - High Sleep Efficiency: Average user sleep efficiency is ~91%, reflecting healthy sleep hygiene across the user base.
    - Strong Retention: 88% of users remained active after four weeks, but a small cohort dropped off in the second week, suggesting targeted retention campaigns could help.
    - Engagement Segments: 73% of users fall into the "High Frequency" segment (active 20+ days), while only 9% are classified as "Low Frequency," highlighting a core group of committed users.

- User Status: Nearly 88% of users are classified as “Active” based on recent activity logs.

2. **Activity Trends**
    - Most Active Day: The highest activity levels were observed on Day 2 (Tuesday), indicating a midweek peak in motivation.
    - Sharp Monthly Decline: Total steps fell from 4.8M in April to 2.4M in May, confirming the need for engagement-boosting interventions.
    - Weekly Patterns: Tuesdays and Wednesdays show the highest average steps and distances, while weekends have slightly lower activity.
    - Seasonality: There is a clear trend of declining activity across the month, possibly due to user fatigue or external factors.
3. **Health & Wellness**
    - Heart Rate Distribution: The majority of heart rate readings fall between 63 and 88 bpm, with an average of 77 bpm, indicating a generally healthy population. Outliers above 100 bpm are rare.
    - Stable Weight Trends: The average user weight is 72 kg, and BMI averages 25.2 (borderline “Normal/Overweight”). Most users maintain steady weight, with only minor gains or losses.
    - Sleep Patterns: Users average about 419 minutes (7 hours) of sleep per night, with longer sleep durations on Sundays and Wednesdays.
    - Sleep Efficiency: High average sleep efficiency (91%) indicates users are not just spending time in bed, but actually sleeping well.
    - Percentile Analysis: Heart rate percentile cards (25th: 63 bpm, 75th: 88 bpm) confirm the narrow distribution and low outlier risk.
4. **User Stats**
    - Most Active User: User ID 8877689391 leads with 497,241 steps and 106,028 calories burned, exemplifying the upper bound of platform engagement.
    - Top 10 Leaderboards: Leaderboards for steps and calories reveal a “power user” group that drives overall activity trends.
    - BMI Segmentation: The majority of users fall in the “Normal” or “Overweight” BMI categories; only one user is classified as “Obese.”
    - Frequency Segments: 73% of users are “High Frequency,” emphasizing strong platform adoption.

- Comprehensive User Overview: The activity overview table makes it easy to compare users on all key health and engagement metrics for coaching, interventions, or rewards.

ACTIONABLE INSIGHTS

Engagement Interventions: Address the sharp decline in activity post-April by launching challenges, personalized notifications, or in-app rewards.

Retention Boost: Target users at risk of dropping off after week 2 with encouragement emails or milestone badges.

Sleep and Health Coaching: Use high sleep efficiency and stable HR trends to identify users for "success stories," while supporting lower-efficiency outliers.

Segment-Focused Campaigns: Leverage the high percentage of "High Frequency" users for social proof, and design onboarding flows to convert "Low Frequency" users.

CONCLUSION

By connecting PostgreSQL to Power BI and creating an end-to-end dashboard, we have transformed raw fitness data into actionable business intelligence. This enables deeper user understanding, supports targeted engagement strategies, and lays a foundation for personalized health analytics within the Strava ecosystem.