BEAT: Project Proposal

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CIS4914: Senior Project

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September 10, 2023

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Abstract

Understanding one's lifestyle is increasingly being recognized as an important part to ensure

peak personal health. As a result of this, this project proposal is developing a lifestyle tracking

and analysis platform, which aims to provide a comprehensive view of an individual's daily

habits and activities. The main component of this platform is integrating a variety of data sources

such as smartphone applications and user inputted data. This integration ensures that a user gets a

complete picture of their physical activities, emotional well-being, and dietary patterns. A key

feature of the platform is its data aggregation capability; Instead of viewing fragmented pieces of

information, users get a big picture overview of their lifestyle, making it easier to understand and

interpret. Furthermore, the platform emphasizes the importance of visualization and reporting.

With intuitive dashboards, users can quickly grasp their lifestyle metrics, track their progress

over time, and even compare their current performance against set personal goals. This visual

feedback is invaluable for users to identify areas that need attention and improvement. In

conclusion, the proposed platform offers a promising solution for individuals seeking a holistic

approach to personal well-being, bridging the gap between disparate data sources and actionable insights.

Introduction and Motivation for the Project

In today's era of technology, the modern individual has access to many different applications and devices designed to monitor a specific aspect of their lives. These platforms provide useful and applicable data such as daily steps, sleep tracking, and gauges of emotional well-being. However, with the increasing number of these tools, the average user often finds themselves spending more energy trying to piece together insights between these multiple platforms than the insights are worth. This is the problem looking to be solved by BEAT. An individual might use one application to monitor their daily physical activity, another to keep tabs on their dietary habits, and yet another to log their emotional well-being. With each of these platforms fragmented away from each other, users are burdened with the task of manually aggregating and interpreting the separate sources of data. This fragmentation limits a user's ability to gain valuable and holistic insights into their overall health and well-being. The motivation for BEAT is to aggregate these data sources into a central location, and provide trackable trends and insights in a simplistic, user-friendly manner. BEAT can empower users by allowing them to make well-informed decisions regarding their health and well-being. This project proposes to integrate data from diverse sources such as Strava, MyFitnessPal, and direct user input, to provide users with a unified perspective of their overall well-being. Visualization will be central to the project, aiming to provide users with a quick but comprehensive understanding of their health trends without requiring them to spend too much time analyzing data. In the broader context of software engineering, this implementation could lend more credibility to the power of integration, visualization, and user-centric design.

Objectives

The primary aim of this project is to create a comprehensive Lifestyle Tracking and Analysis Platform, designed to present users with a holistic view of their well-being by merging diverse data streams in one application. Central to this endeavor is the integration of data sources such as Strava and MyFitnessPal, and user input to gather data about each user. This ensures a seamless, unified perspective on physical activities, mood activity, and diet.

A key feature of the platform will be its user-friendly visualizations, transforming various data into easily digestible formats for the user. This not only allows users to access and understand their lifestyle metrics but also creates a deeper understanding of their daily activities. Furthermore, the platform aspires to facilitate consistent progress tracking and reporting to ensure consistent trends are being displayed. Users will be equipped with robust tools, enabling the setting of personal benchmarks and offering a clear view of their performance in relation to these goals. The software will generate trends which will spotlight areas needing attention, guiding users towards tangible improvements. On the software front, scalability will be a driving factor, ensuring adaptability to future data sources and evolving technologies such as wearable watches. Another key feature of the application is dedication to user privacy ensuring secure data storage. Additionally, the user interface will prioritize simplicity to cater to a broad audience. In conclusion, the application's main objective is to allow users to view valuable insights about the data they collect everyday.

Literature Survey

[Individualizing Whoop Watch Data](#) – This blog post details an athlete's experiment in utilizing the data from his Whoop (health tracking watch) in order to gain personalized insights towards improving his performance. This is a great example of using the data one's devices are collecting in order to guide health & fitness decisions.

[Strava Documentation](#) – Strava's documentation details and is an example of how to hook up to their API in order to begin working with strava data.

[Benefits of Mood Tracking](#) – This blog post by the Calm app details the benefits of tracking one's mood.

[Wrangling data from a variety of fitness apps and devices](#) – This New York Times article discusses aggregating data from the plethora of health/wellness monitoring apps and devices we have and provides some cool examples.

[API Management Best Practice](#) - An Article by Google Cloud discussing the design principles and common pitfalls when working with APIs

Proposed Work

After gathering and understanding the specific requirements for our project, we will focus on design. During the design phase we will focus on system design and UI design. System design involves architecting the backend system, designing the database schema, and determining how data will be fetched, processed, and stored. UI design involves crafting an intuitive and user-friendly interface that will prioritize simplicity and ease of navigation to improve the user experience.

Next is development. The development phase will involve setting up and implementing the backend infrastructure, integrating with third-party data sources using APIs, developing the UI, and implementing the necessary visualization tools. Data management, aggregation, and visualization will need to be implemented in this phase.

Finally there will be testing and deployment. This involves unit testing to ensure individual components of the platform function as intended, and setting up the infrastructure for hosting the platform.

Some potential technologies / languages to be used are Node.js for backend development, react.js for frontend development, MongoDB for database, RESTful APIs for API integration, and AWS for cloud hosting. These are only examples and are subject to change.

Project Plan

Ongoing:

- Code and Meeting Notes will be tracked within [our Github repository](#).

- Advising sessions with Sumi Helal will be held biweekly (on Tuesday morning).

- Our roles will be distrubited based on our strengths (front- & back-end).

- We will be collecting our own data for this project on a constant basis for the project.

- Stand up meeting will be held weekly on Wednesday to keep the team up to date and address any blockers

Weeks 1-2: Project Specification (Done)

- Team has met, evaluated the original proposal, and updated its specifications to be the sum of all interests for this vision.

- Our priority is keeping the scope limited, and therefore it was necessary to understand what the minimal viable categories of lifestyle we could track.

- September 10th - Proposal

Week 3-4: System and Interface Design

- Our back-end team will develop an architectural diagram to understand how the processes and data will be managed..

- The front-end team will create the user facing displays, charts and interactions.

- Cross-checking will be done to ensure minimal overlooking of mistakes.

- September 24th - Complete System & Interface Designs

Week 5-11: Implementation and Validation

- Implementation begins with the lower level components of the platforms architecture, upon which the platform integration can be hooked in. In the best case, the integration of the APIs will be easy once the lower-level code is in place. As the API's will both be responding with data, we can build a generic API class to handle the data with specialized integration classes for the data types output by the specific integrations.

- With the use of our own data, we should be able to validate while we implement. We will need a bare minimum of the integration responses and a single UI view to view our data.

- Code Review will be a requirement of merging a pull request, to ensure that code works on multiple machines and documentation is present before adding code to the main branch.

- November 14th - MVP hosted on the web for feedback usability.

Week 12-14: Delivery

- Our team will be smoothing the kinks out of our application and preparing a final presentation for the showcase event.

- We will ensure our advisor is happy with the job before finalizing it, and get his confirmation on our presentation to ensure it is as competitive as possible.

- November 28th - Fully functional publicly tested application and presentation

Week 15-16: Submission & Documentation

- With our public Github repository available for viewing, most of our source code will be available to see with complete functionality and documentation.

- Assigned deliverables will be included on a public static Github Pages site that will hold a mp4 of our presentation as well as any associated assets of the project for non-administrative personnel to access our deliverables easily.

- A post-project retrospective will be conducted to discuss what went well and what could be improved for future projects.
- December 8th - All work finished complete and well.

Conclusion

Due to all of the technological advancements that have taken place within the past 20 years, keeping track of one's health through stats and indicators has never been easier. Devices like smartphones and smartwatches have made it possible to monitor sleep cycles, heart-rate, calories burned, menstrual cycles, nutrition and much more. BEAT aims to utilize the technologies available through smartphones to help users track and visualize some of these important health markers. BEAT will take in data from Strava, Myfitnesspal, and direct user input to show users how their steps and meals affect their mood and overall wellbeing over time. Users can use this data to make more educated decisions about eating and walking to help improve their emotional state throughout the day. BEAT aims to achieve all of this by utilizing frameworks like MongoDB, AWS, and React. With a detailed schedule and plan going forward, the goals of BEAT can be accomplished by the end of this course.

References

Individualizing Whoop Watch Data
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