Case Study - Personally Training For Caribbean Health(PYTCH) Project

PersonallY Training for Caribbean Health (PYTCH) is an association of personal trainers from around the Caribbean that work together sharing resources, knowledge, data and research to improve personal training quality and effectiveness with a goal of improving health and physical mobility of persons of all ages, stages and health throughout the Caribbean.

Over the last 10 years they have been incorporating a wide range of mobile apps and devices into their practice to assist them in offering the best monitoring for, as well as advice to, their clients. They also do their best (when permitted by their clients) to not just curate and analyse data for client feed back but also share data and use for general population research. This has helped them to identify patterns of activity useful for diabetes treatment based on gender, age, activity levels and body mass index.

They have also been able to identify co-relations between early onset hypertension and low mobility among teens. Another interesting set of co-relations has to do with certain professions', levels of inactivity. This has helped them to develop interventions for specific types of workers.

They have been using a range of third party applications and have struggled with the challenges clients have with installing so many different applications. What is worse is that many of the applications require specific settings to be turned off to avoid them conflicting with each other and this is difficult to convey to clients.

Furthermore the data from these various apps may not use a single standard format so collating for analysis across multiple users has been problematic.

They have therefore turned to a software development firm **(SWEN3120 Company Limited)** for a single solution to be used by all clients of trainers in the group with features that will help them meet their goals.

No requirements specification document has been produced, but the team is willing to work along with you to get the system developed using an agile approach. Your team has been asked by the senior software architect to develop an architectural design which can be used to guide the agile development project. Multiple teams have been asked to propose a design and the senior architect will be working with an evaluation team to evaluate and select a final solution.

Below is a summary of the most important features:
1. Collect sensor data and other values from an affordable and robust wearable device (most likely a watch - they have not selected a specific one yet) heart rate, blood pressure, activity level, steps - any of these can be measured on demand, periodically or based on association with a specific context* of an ongoing activity being performed by the personal training client.
2. Periodic and/or on demand forwarding to a cloud storage
3. The personal training client (app user), must be able to specify whether they opt in or out of sharing their data with the **PYTCH group for research** or with **their trainer only** or **with no one** once it goes up to the servers.
4. Further the app should be able to demonstrate using an avatar or human recording how to properly do a particular exercise (named exercises must be dicoverable via search).
5. The app should be able to display a complete timed routine created by a client's trainer. This would essentially be a series of exercises with times and number of reps etc. as defined by the trainer and this would play on the app on client's mobile device. Each such routine must be classified so that once the client indicates start on the app the wearble device appropriately records the various measurements on the phone for aerobic, yoga, stretch etc activity. This way it is possible to analyse sensor data with information on the context * (see point 1) of type of activity being done.
6. PYTCH group also wants the client to be able to indicate context of exercise manually in the device (watch etc) when doing any other exercise such as cycling, stretching, walking, running, yoga, stretch etc. on their own without the app.
7. Using the app, the client should be able to access past data and analysis from the cloud service.

The following concerns should be addressed/considered:
Based on the number of clients and the fact that they all have different schedules and the app may eventually include international clients in diffferent zones there is no room for down time on the part of the service provided by PYTCH for getting data and pushing data to their servers. You wonder if there are some services that need not be 100% available - this needs investigating

Clients had many issues with battery life in the past. While the PYTCH team is aware that this problem cannot be completely eliminated they are looking forward to significant improvements in the utilization of battery life and have asked to try to ensure that clients watches can be optimised to give at east a week of service without requiring charging - Does this sound reasonable? Can you achieve this? Do you need to address the expectations of these clients?

You met with the develpment team and they have many questions about the physical layout of the system and whether the cloud service will be privately owned and managed by the PYTCH team or if a thrid party provider will be used. Their concerns range from security to cost and the level of success to managing performance and scaling strategies.

While the PYTCH team has a preference for the agile approach they are constantly concerned about costs and want to have a good idea as early as possible abouts costs and time line because they must seek sponsors and investors as they are a non-profit organisation. ***NB. The trainers run their own personal businesses as individuals but as an association they are members of a non profit that collects dues to operationalise projects they embark on as a group.***

You did a focus group with 20 of their current clients (a very small subset) who have been willing to partcipate in these activities where their data is collected and analysed and also shared. Their main concern was with security as they were worried about personal data such as name age dob and personal stats such as weight and even location data (sometimes collected during walks etc) being reflected in the data base and accessible to trainers other than their own personal trainers.

Another user concern had to do with frequent updates that caused them to lose data in the past as well updates that made their systems not work as well. In many cases they ended up having to do without a necessary app for days until changes were either fixed with a new update or they figured out how to reinstall an old version. Sometimes they lost access to some features. They would like to be able to decide when an update was done (not automatically) and they wanted the freedom to switch back to an old version easily if they wanted to.