

Aprima: Using Apple Watch to Transfer Personal Health Data to an EHR

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Abstract

Our project is to take the health information gathered from an Apple watch and to send it to Aprima's REST API for use in Electronic Health Records (EHR). There is a lot of information that new technology is allowing us to keep track of (daily step count, how well the user is sleeping, etc.) that doctors do not currently have an easy way to access. Our goal is to make an app that will make transferring that data easier.

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Executive Summary

Healthcare is a significant part of everybody's lives. No matter what age you are, health is something that should take priority in people's lives. And In this day and age, technology has become so commonplace that it is embedded in most of our ways of life and this includes health. People have smartphones that carry a wealth of data and with the introduction of Healthkit, people can track certain health statistics that it has become increasingly convenient to monitor one's health. The purpose of our project is to create an app for Aprima that exhibits this convenience for many people. Our goal is to create an iOS application that will automatically pull a user's health data from Apple's HealthKit and upload that onto an electronic health record (EHR). By doing so, users will have the convenience of uploading daily activities and stats to an online database where their doctors may access it easily. The doctors can compare current data to previous data and make an informed analysis and diagnosis of a patient's health. This will be beneficial to both patients and the doctors who will be accessing the database.

Many health applications exist already from fitness apps to simple daily health tracker apps. These apps all utilize Apple's HealthKit to record data from the user and to display it. Our app will utilize the HealthKit to not only pull and display data from the user, but will also allow the user to opt in to upload that data automatically to an EHR. The main advantage of this app over other apps is the convenience of sharing the data with a doctor. The app will have the special function of pulling data directly from an Apple iWatch. This allows for even more accurate health data to uploaded to an EHR such as heart rate stats.

I. INTRODUCTION

Aprima produces software for the healthcare market focused on electronic health records (EHR) and practice management. One of the fastest growing companies in North Texas with over 1700 clients. The objective of this project is to collect health data from an Apple Watch with an Apple iPhone and transmit the data to Aprima's EHR via the REST API. What is available is the Apple Health app and Healthkit built into each apple product. Users can use the apps to track their own records of their daily activity. These include steps, calories burned, meals, heart rate and much more. What we plan to do is gather this data and send it to an online EHR for doctors to view and use. We must build a working app to communicate with not only an Apple Watch but the online EHR. We also plan to create a simple UI for the app for the expected broad user base.

II. DISCUSSION

We plan to as a team, develop and build an iOS app for Aprima. This means we have to become proficient in coding in Swift (Apple's native coding language). We plan to use current fitness apps to pull ideas and references from for inspiration. Current market fitness apps push and pull data which will be critical in the implementation of our app. We then will perform full Healthkit integration with all the available features it has. What we expect as a result is at the minimum a working app that communicates with healthkit and pulls health data from an apple watch. The stretch goals include integrating into the Aprima EHR database system. What makes our solution unique is, this will be the first time Aprima will have set a goal to work with the Apple watch. This will pioneer future applications and projects surrounding an Apple watch.

III. RESOURCES

A. People

- a. Matt Spradley - Company mentor
- b. Devon Gilbert - Primary Technical Contact
- c. Jeff Lott - Secondary Technical Contact
- d. Balakrishnan Prabhakaran - Faculty Mentor

B. Hardware

- a. Personal Windows PC (4)
- b. Apple Watch (2)
- c. Apple iPhone (2)

C. Software

- a. VMWare
- b. Mac OS X 10.11
- c. Xcode 7.2

IV. **KEY ROLES**

- A. Point of Contact, Team Captain, GUI Developer
 - a. David Nguyen
- B. Meeting Organizer, Lead Researcher, Data Conversion
 - a. Henry Dinh
- C. Github Manager, Healthkit Integrator
 - a. Tyler Huning
- D. Team Mediator, Rest API Integrator
 - a. Timmy Nguyen

V. **Communication Plan:**

Weekly Skype Meetings

- a. Monday 9pm
- b. Tuesday 9pm
- B. Weekly In Person Meetings With Sponsors
 - a. Thursday 1:30pm
 - b. Friday 1:30pm
- C. Group Chat
 - a. Team is setup with a group chat to be used and checked frequently daily

VI. **Risk analysis/Contingency plan**

- A. Contingency Plan for When a Team Member is Sick
 - a. Meet with remaining members
 - b. Discuss workload
 - c. Split evenly amongst remaining members to their strengths
 - d. Alert faculty sponsor and company mentor of changes
- B. Contingency Plan for When Something Inevitably Goes Wrong
 - a. Evaluate what went wrong
 - b. Physical group meeting to discuss options to move forward
 - c. Notify Company Mentor
 - d. Advise situation
 - e. Determine the risk of the problem not being solved
 - f. Evaluate a solution
- C. Contingency Plan for When Products Do Not Arrive in Time
 - a. Get accurate ETA
 - b. Alert Company Mentor of setbacks
 - c. Work around problem as much as possible
- D. Contingency Plan for Disagreements
 - a. Address all point of views of the issue
 - b. Initiate a vote
 - c. In case of tie readdress points again
 - d. Initiate a vote
 - e. Team captain may advise with company mentors otherwise vote counts as two

VII. COSTS

A. Apple Related

- a. Apple Watch \$599.99
- b. Developer Account \$99.99

VIII. TIMETABLE

- a. Phase I: due 2/25/2016:
 - Working iPhone app with user friendly interface that provides a demo of how the final app will be presented.
- b. Phase II: due 4/14/2016 :
 - App now has functionality and is able to transfer health data gathered from iPhone to an EHR automatically.
- c. Phase III: due 4/28/2016:
 - App now works in sync with Apple iWatch and is able to pull health data from the iWatch to automatically send to an EHR.

IX. CONCLUSION

This project will help people easily send information to their doctors so that they can make better informed decisions regarding their health. This app will give doctors more information that they did not previously have access to by transferring the data from Apple's Health app to Aprima's REST api. It is our hope that this information will benefit the doctors as well as the clients who will be receiving instructions from a more informed doctor.

X. CONTACT INFORMATION

A. David Nguyen

- a. Contact
 - i. Email
 1. ddn051000@utdallas.edu
 - ii. Cell
 1. (214) - 215 - 3792
- b. Biography
 - i. Attended UTD from 2005-2009 for a bachelor's in Biology. Second bachelor's senior in Computer Science.

B. Henry Dinh

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 1. (214) - 208 -2950
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 - i. Senior studying computer science at UTD. Currently in fast track program and will pursue masters in computer science Fall 2016.

C. Tyler Huning

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b. Biography

i. Senior Computer Science major at University of Texas at Dallas with plans of getting masters in Computer Science after graduating.

D. Timmy Nguyen

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b. Biography

i. Senior Computer Science major at UTD with plans of entering the field after graduating. Hope to become a representative for North America at the GBWC


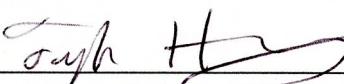

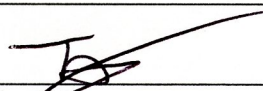
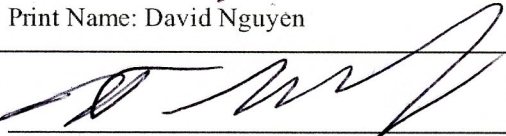
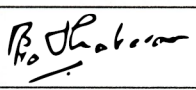
XI. SOURCES

1. <https://developer.apple.com/healthkit/>
2. <http://www.aprima.com/>

XII. APPENDIX

A. Websites

- a. https://developer.apple.com/library/prerelease/ios/documentation/HealthKit/Reference/HealthKit_Framework/
- b. https://developer.apple.com/library/ios/documentation/HealthKit/Reference/HealthKit_Constants/index.html#//apple_ref/doc/constant_group/Nutrition_Identifiers
- c. <http://www.slideshare.net/MattSpradley/how-we-built-a-mobile-electronic-health-record-app-using-xamarin-angular-and-web-api>

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