YourHealth - a Healthcare App

08, 03,2017

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CMPT 276 SPRING 2017

Domain

The application domain is healthcare.

We are inspired by apps such as DoctorOnDemand, MicrosoftHealthVault and AmWell. These apps are popular in the healthcare domain, but they have some disadvantages that we would like to improve by creating our app - YourHealth. For these three existing app, they have similar functionalities such as creating documentations about patients based on their symptoms, conditions, food and drinks intakes; then schedule appointments for doctors with patients. We think a platform where doctors and patients can communicate freely is needed; a helper which patients can rely on is needed; and an app which is easy to use and easy to adapt to is needed. We will explain our app's functionality in the Functionality section.

Problem

The Bigger problem

Individuals and families' lives have become increasingly busy, all the while technology has become more interconnected with our daily lives. While most other sectors in the economy have adapted to these changes, the healthcare sector has failed to keep up with society's needs and advancements in everyday technology. As such the healthcare sector continues to be plagued by unnecessary inefficiencies and bureaucracy of times past. Consumers and providers alike need a platform which is easy to use, easy to access and easy to maintain, while having a positive impact on all parties involved.

Sub problems

1. **Making Health A Priority:** As a consequence of the increasing business in our lives, individual's' health can be put forgotten as a priority. With this app, Doctors and their Patients can work more closely on developing Health and Fitness goals for their lives. The Goals are developed together during a regular appointment, then uploaded to the app. Traditionally, Doctors and patients might set health goals, but without a central place for them, they may have to remember, or just write down a note. As such, with 100's of patients it can be an impossible task to keep track, monitor progress and achieve goals. This can cause problems as the goals can be easily forgotten or misplaced, and the patient can suffer as a result. Also, without a specific goal and a measure of improvement, the patient may lose motivation to work towards their health goals. YourHealth offers a unique solution to this problem, integrating it into a doctor's medical practice to add great value to their practice.
2. **Adapting to the 21st Century:** Currently, many doctor offices only allow the booking of appointments through the phone. This can be challenging for patients who have busy schedules and may not have time to call the doctor's office during business hours. Also, it can be difficult for a receptionist and patient to find a time that works for both patient and doctor, and they may spend unnecessary time going back and forth with different dates and times.

3. **Simplifying the Process:** Requisition forms for tests can easily be lost between a doctor appointment and the test itself. This can be a waste of time for both patients and doctors and the patient would have to schedule a second appointment just to receive the same requisition form. Also, a patient may not have a record of tests they've gone for in the past, and therefore may not be sure when to schedule a new doctor appointment to receive their next test.
4. **Making Health Accessible:** Currently, if you need to see view your test results on your latest blood test or medical notes from your last appointment you will need to go see your doctor and discuss the results. With YourHealth Doctors office's upload the results to your profile and you can view them. If an appointment is required, or the patient wishes to have one to discuss the results, both the Doctor and Patient can easily request an appointment.

Purpose and Audience

The purpose of this application is to create a convenient environment that creates a more involved, accessible and efficient healthcare environment for patients and their healthcare professionals. This will allow doctors and patients to quickly and easily access their appointments, test requisitions and results, and to view and set health goals for patients. YourHealth is all about creating a more active relationship between doctors and their patients.

The business value of our project will come from healthcare clinics and patients who attend these clinics. The app can be modified and customized to fit the needs of any clinic. What's more, this app will provide the users a whole new version of how technology can change the world. Doctors and patients will be our audience.

Story Line

What is the story line of your project? Here you will explain from customer's perspective.

YourHealth has two main customers, Doctors and their Patients: below are their story lines about how this app can be integrated as a healthcare solution in their lives:

Patients: This app simplifies the whole day to day healthcare process while helping to improve quality of care. The app offers all the required functionality needed by most patients to save time. On top of that, this app provides a patient a more involved healthcare experience. It does this by offering the unique health and fitness goal aspect to the app. Having well defined goals, with steps (developed and written by the doctor) on how to reach them, is much easier to achieve.

Doctors: This app allows healthcare providers to be more involved in the lives of their patients. It provides a streamlined way to organize their medical practices, allowing more time to focus on their jobs. The unique feature with YourHealth is the ability for Doctors and Patients to develop, plan and set patient health and fitness goals together. Examples of such goals are provided on page 3 under "Health and Fitness Goals" header.

A More Detailed View of App Functionality:

All Users:

When a user first opens the app, they will see a screen that allows them to register or log in. There will also be a button that allows them to view a screen that has a help section, an about the app section, and a resources section.

Register:

When a user registers a new profile using the app, they will need to provide their email, legal first and last name, desired password, as well as their HealthCare Identification Number as issued by the government. They also have to choose a user type from a drop down list, which will include: doctor and patient or medical staff. Then, if their registration information is successful, they will be taken to the entry screen. This information will be validated through existing databases to ensure accuracy of information and correct permissions granted.

Login:

If the user already has an account with the app, they will enter their email, password, and type of user (doctor or patient), and if successful, they will be logged in and taken to their respective entry screen with user specific permissions.

If the user has forgotten their password, there is an option to select that they have forgotten it. They will be taken to a screen where they will be able to enter in their HealthCare Number and email in order to reset their password.

Health and Fitness Goals:

Below are two examples of health and fitness goals that would be developed by a doctor and patients. Doctors can formulate a patient specific plan of action to reach these goals, and update as they progress towards them.

1. Patient #123 has a fitness goal of losing 5 pounds over the next 3 months to reach a more optimal BMI by:

· Not skipping breakfast, instead having high protein breakfast.

· 30 minute walks, or 15 minute jogs, daily.

· Drinking over 8 glasses of water a day.

· Increasing fibre intake in diet

2. Patient #777 has a health goal of reducing their blood pressure and cholesterol levels by 20% over 3 months. This will be achieved by:

· Taking daily, as prescribed, medication XYZ

· Eliminating Trans Fats from diet

· Taking 15-25 minute walks daily

Doctor:

When a doctor reaches their entry screen, they will see a view that will act as an entry point to other views. One will be the patient list view, where the doctor will be able to see a searchable list of all of their patients. This screen will also allow them to add patients to the list. If they click on the

"add patient" button, it will take them to a new activity. Here they will be able to enter the email address of the patient they wish to add. It will send a request to the patient. If the patient accepts, their information will appear in the doctor's list of patients, and their profile will be able to be edited by that doctor.

If the doctor selects a patient, it will take them to a view of the patient profile. There will be certain areas of this profile that the doctor will be able to edit. These include setting goals for the patient, uploading a requisition form, and entering results of patient tests. These sections are outlined in the patient profile section below.

There will also be an appointments section on the doctor's profile screen. It will display a calendar that contains all of the doctor's currently scheduled appointments. There will also be a button that will allow the doctor to request an appointment with a patient. It will take the doctor to a new activity, where they will enter the patient, date, and time of the desired appointment. This request will be sent to the patient. If the patient accepts, the appointment will be added to the doctor's calendar.

Patient:

When a patient reaches their entry screen, they will see their patient profile. This will contain a view for their results from tests, test requisition forms that their doctor has uploaded, goals that the patient and doctor have set together, and a place for them to view their currently booked appointments and book new ones.

The test results section will contain a text field that is able to be edited by their doctor. This field will contain a summary of the patient's results from their recent tests. It will also contain a button that will take the patient to the test requisition activity. The test requisition activity will contain downloadable copies of test requisitions that their doctor has uploaded. They will be able to download and view these requisitions for later use.

The goals section will contain a table that the doctor and patient will be able to edit and add to. The table will have columns: Goal Type, Current, and Goal. An example entry would be Goal Type: Blood Pressure; Current: 140/80; Goal: 120/80. Tapping on any of these fields will allow editing of the field. There will also be a button that will allow the user to add a new entry to the table. They will be taken to a new activity where they will be able to fill in a new entry. Once they click on a button to add the entry, they will be taken back to their main screen, where the new entry will appear in their goals table.

They will also be able to add a doctor to their profile so the doctor has access to their patient profile and will be able to upload information to it. There will be a button to add a new doctor. In that screen, the user will enter the email address of the doctor they wish to add. This approved Doctor will then be given permission to edit the appropriate fields in the patient profile, and the patient will appear in the doctor's list of patients.

The appointments section will allow the patient to view their currently scheduled appointments. It will appear as a calendar on their patient profile screen. There will also be a button that will allow them to book new appointments. This will take them to a new activity where they will be able to choose a date and time, and book the appointment. This will send a message to their doctor

requesting the appointment. Once the doctor has accepted the appointment, it will appear in the patient's calendar.

Required Functionality

What functionality in your software deliver in the next sprint.

Scheduling Appointments:

The appointment feature in our app will allow patients to schedule checkups, and doctors to manage their schedules. When patients request an appointment, they will be provided with a list of available time slots of the doctor, by choosing the available time slot of the doctor, the appointment will be added to both patients and doctors calendars, and the doctor will receive a notification of new appointment. Patients will also be able to refer to their past appointments, and the app will send a reminder to book an appointment if the patient needs to come for regular checkups.

Pop-up Windows:

Our app will have a pop-up window alert for patients. During the day, say 9am, 1pm, and 6pm, our app will ask the patient to input information about food (or activities) they ate (did) to keep track and make sure that they meet their nutrition requirements (eg. If one patient has diabetes, the app will send him an alert when his sugar intake is too much).

Emergency Button:

There will be an emergency button on every screen. When emergency happens, by pressing the button and choose your condition from a dropdown menu, the app will call 911 for you and it will give you step-by-step instructions of what to do at the moment for your condition. And after the condition has been handled, (e.g. when the ambulance get there), you can press the End button to end this functionality.

Medical Terms:

Doctors always use medical terms a lot which might be hard for patients to understand and they are too busy to explain all of them. Our app will provide a list of terminologies which are commonly used by doctors, so next time when you hear "BE", you would know what they are talking about.

Requisition form:

By having a shared space within the app that both doctor and patient can access, the doctor will be able to upload a requisition form, and the patient will be able to download it and maintain a copy for themselves. Also, both doctor and patient will be able to refer to the past records of requisitions in order to make better decisions for the future. The results of the test will also be able to be uploaded into the app by the doctor, and viewed by the patient. This will allow for faster receiving of results by the patient, and will provide a space to refer back to results in the future.

ColorCoding:

Downloaded test results that are viewable by the user will be outputted in a table format. The data will be colour coordinated as Green, Yellow and Red to corresponded to good health values, borderline values, and unhealthy values respectfully. For standard tests such as blood tests, normal standard result ranges will also be displayed to give the Patient a better sense of the data.

HealthGoal:

Our app will provide a place for doctors and patients to actively design a health plan together. They will be able to input health goals such as blood pressure, cholesterol levels, and weight. As the patient works towards their goal and gains results, they will be able to input their progress into the app and see how they are improving. This will provide motivation for the patient to continue to work towards their goals, and will provide doctors with a place to refer to how their patients are doing and where they may need additional support.

Desired Functionality

Here you will explain the added functionality that you will deliver in the last sprint.

Payment form section:

Patients will be able to enter their payment information and pay for doctor appointments. Doctors will be able to invoice patients and receive payment. (Note: we are not intending to implement secured payment here, just a form that takes in and checks for valid visa/MasterCard information. The patient's sending of the payment and the doctor's receiving of the payment will be entered into each of their profiles in the database).

DoctorNote section:

A feature where doctors will be able to provide notes for patients who need proof of sickness for work or school. In this section the doctor can create notes for himself for future appointments or put notes for the patient to see. The patient notes will be sent to the patient's profile where the patient can access once they have logged into their account. Once a shared note is set a notification is sent to the patient. All notes will be saved locally!

Prescription section:

Doctors will be able to upload their patient's prescriptions into the app, and the patient will be able to download and/or print it at their leisure. They will also then have a copy of their prescriptions for later reference.

Emotion check:

If some patients have psychiatric illness such as Depression, our app will check up on their emotion every time when they open the app. When they open the app, a window will show up and ask them to rate how good are they feeling on a scale of 1 to 10; what's more, our app will also send this to their doctors so they can change medicines for their patients if the current one is not working so well.

Proof of insurance section:

Patients will be able to upload a copy of their insurance papers/card. The doctor's office will then be able to view this document.

OverviewChart:

This is a place where you can take a look at your health overview. Your weight, blood sugar, blood pressure and more over the past few weeks, months will be easy to access by simply click the

button. The data will be presented in chart forms such as pie chart for nutrition intake, curve chart for weight. From here, you can see a trend of your condition and how far away you are from your goal. This functionality will give you great motivations for achieving your health goal.

OnClickCommunication:

This will open up the default email app for the android application and create an email with their doctor as the "TO:" address. If the user clicks on the phone number provided, it will open up a phone call to the clinic. This is just an added feature to make communication simpler for the patients.

RelaxZone:

When you feel tired from a day of work or having trouble falling asleep, this is a place where you can relax by listening to relaxing music.

Appendix

User Functionality:

This appendix allows the reader to get a more point form explanation of the various functions, activities and permissions of the users.

The YourHealth Application Allows:

A Patient of a Doctor to:

1. Request an appointment (to see doctor).
2. Request to have tests done (blood work, scan).
3. Request reference/permission to see specialist.
4. View Health Fitness Goals, and doctor provided steps to achieving said goals.
5. View Doctor posted Test Results
6. Send private messages to Doctors

A Doctor of a Patient to:

1. Request an Appointment (for patient to see doctor)
2. Request to send patient to have tests done (blood work, scan, etc..)
3. Request to send patient to see specialist.
4. View patient medical record and past written notes on patient.
5. View patient previous test results
6. Develop health and fitness goals and write steps needed to be taken to achieve.
7. Monitor patient health goals
8. View list of patients, as well as their profiles
9. Send private messages to Patients

A Doctor (In General) to:

1. View their list of patients and or search for and open the profile of their specific patient.
2. View profiles of patients (contact info, health info, etc..)
3. View their appointment calendar

Data and Databases:

Data and information is crucial to the full functionality of this app, as such the following is a detailed explanation of the database structure and management system implemented in our app.

The Database will consist of a number of SQLite Tables:

1. A Table for each profile type of patient and doctor that will be used to verify users at login time. An example table for each is given below. These tables will be loaded on the app installation from a server, they will be updated if there is new data to fetch (verified by using php script on server to see if database has been updated since last download).

Patient_Registration_Verification_Table

First Name	Last Name	Health Identification Number	Doctor Unique ID
John	Smith	12345678	55555

Variables explained:

First Name: The Users Legal First Name

Last Name: The Patients Legal Last Name

Health Identification Number: This is a number is given to all residents, patients of doctors in the British Columbia Healthcare System.

Doctor Unique Id: This is a Unique ID that a doctor gives his patients to up on his app. The Doctor chooses this unique ID when he or she registers themselves and their practice through the YourHealth App.

Doctor_Registration_Verification_Table

First Name	Last Name	HealthCare Provider Number
John	Smith	77777

Variables explained:

First Name: The Users Legal First Name

Last Name: The Patients Legal Last Name

HealthCare Provider Number: This is a unique identifier that that all registered and practiced physicians have. We made assumptions that it is a 5 Digit String for the prototype, but could easily be changed to meet the requirements of other unique health care provider identification.

Note: Since this is a prototype, we will create mock data that would easily be substituted and adjusted for real data, once the application begins to be used by healthcare providers and their clinics.

2. A Table for basic information on each patient. This will include contact information, basic medical information etc…

Patient HealthCare Number	Street Address Number	Street Name	Postal Code
12345678	12345	Smith Avenue	V6A 8R2

City	Phone Number	Cell Phone Number	Emergency Contact Phon
Vancouver	123-456-7899	998-765-4321	123-456-7777

Variables explained:

Patient HealthCare Number: The Patient's Unique HealthCare Number Identifier

Street Address Number: The Patient's Street Address for the Patient's main residence. Input Will allow for input format NUMBER - APT/SUITE/Unit #. This means the Number and apt suite number separated by a hyphen, other formats will not be accepted so as to not allow errors in the comma separated value table.

Street Name: The name of the Street for the Patient's main residence

Postal Code: The patient's postal code of their main residence.

City: The patient's City of their main residence

Phone Number: A home phone number. If the patient has one. (accepted format with hypen separated values)

Cell Phone Number: A cell phone number if the patient has one. (accepted format with hypen separated values)

Emergency Contact Phone Number: An emergency contact phone number for the patient. (accepted format with hyphen separated values)

Note: Since this is a prototype, we will create mock data that would easily be substituted and adjusted for real data. Ideally, this data would be provided by the Doctor's clinic. In the case that the data is not provided, the Patient can add it and or edit it once registered and logged in at anytime.

3. The calendar component will be implemented such that all the events will be saved onto google calendar. This will be dones using the Google Calendar API (https://developers.google.com/google-apps/calendar/quickstart/android). First a request is made and if successful the method returns an event resource in the repose body which than can be used to add an event into the google calendar.

A table to store calendar events (such as appointments), This will be doctor specific, and stored on the app.

4. A database for Patient medical records and test results to be stored and accessible by doctor of patient and Patient themselves. This table will be limited up to 10 previous test results. These will be summary data inputted by the doctor and put on the server. This data will be downloaded every time the patient logs in to the app. Sample test results would include blood tests, disease tests, x-ray results and any other text results the doctor wishes to input.

Example Test Result as Viewed by User:

Red blood cells: 5–10
White blood cells: 4.2–6.1
HGB: 14.5
Hematocrit: 44.8
MCV: 89 (Mean Corpuscle Volume)
RDW: 13.6 (Red Cell Distribution Width)
Platelet Count: 155

This Sample Blood Test Data is based off of: http://cllhealed.com/wp-content/uploads/2013/12/blood_tests_2009-l1.jpg

Server

All of this data will be stored in a mysql database server online. It will be private and hidden unless the right credentials are given to access the information. This will all be behind the scenes and hidden from the user.With the proper credentials and user permissions, the YourHealth App will be able communicate with the server to upload, modify and download data.

Scheduling Appointments:

This is one of the most important features of the app, and as such a large amount of development time will be put into it to ensure a successful integration.

The Patient will be able to view their doctor's schedule availability, he or she will then make a request to add an appointment. This will be sent to the MySQL server where the doctor's schedule is, a simple script will run to make sure there is no time conflict. The user will be alerted of success or failure of creating the appointment. On success, the appointment will be added to the patient's default calendar app.

The Doctor will be able to download their appointment schedule through the YourHealth app, it will then add this to their default calendar app on their phone.

Technical Aspects:

The Scheduling a portion of this app will (using the google calendar api) create an event in patient's default calendar app on their phone in the defined time slot with a title.

The MySQL Server will store the doctor's calendars.