HealAssist

Project Plan

By

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Introduction

In today's healthcare landscape, many companies are developing novel software solutions to make patients' and their care teams' lives easier. One software, for example, provides a messaging service that enables patients to write instant messages to their physicians/nurses. This causes patients to feel both empowered and truly cared for. Is your child running a fever? Well, it has been strep throat the past three times, so I will have you bring him in for a rapid strep test but let's not worry about the copay this time. Of course, not all physicians would feel safe/generous enough to offer such simple treatments without seeing their patient directly, but this is no doubt a solution patients would enjoy using.

Our proposed software solution will have a similar objective in mind - to make patients feel empowered. Patients generally prefer to be in the loop when it comes to their health. There is rarely a way for a patient to electronically access their own health data. Our software aims to function as a solution to such issues. Personal health information (PHI) will not be stored locally. The solution will provide moderate security, but there is no PHI information to worry about securing besides a medication list.

Features will be, for the most part, geared towards providing the patient with several means to improve their health. Medication, exercise, and other features implemented by this software solution will assist the patient in maximizing their health. In order to track when these activities (taking a medication, going on a 5-mile run) occur the patient will have freedom to log events in their calendar.

For an agnostic calendar event to be created, the patient will fill out a form with a subject, location, start/end times and an event body. The user will then select which calendars to update with the event. Finally, the patient will log whether or not the event occurred and the application will track this information. That way, the patient can see which areas of their health care can be improved upon.

Through use of our application, patients will have a large portion of their health needs streamlined into one application allowing for quick and easy monitoring of health. In this manner, this application will provide patients with a simple mechanism by which they can improve their health. Their physicians will only be a button-click away.

Project Goal

Of primary importance to this project is streamlining physician advice from a patient's physician directly into that patient's hands via the web and additional network-independent modalities. Driving the creation of this application is the lack of accessibility of patient data that would allow patients to more effectively adhere to physician regimens. Furthermore, certain features are intended to allow one's physician to better monitor patient compliance with medical advice. As a result of these high-level goals, our application will assist patients in remembering the specifics associated with even the most complex treatment plans as well as allowing for simple, frequent contact with that patient's physician. With the addition of simple confirmation dialogues, one's physician will also be able to gain a better understanding of patient compliance with treatment recommendations thus allowing that physician to better treat their patients.

Significance

As advanced as available technology is in the United States, one would think patients would have more technology at their fingertips assisting in combating debilitating illness or preventing illness from presentation. There are many applications that assist patients in making doctor appointments quickly and easily and modifying such appoints. However, applications that provide patients with bespoke treatment regimens designed and recommended specifically by their physician are in short supply. Furthermore, applications that allow physicians and patients to have real time interactions when treatment modifications are necessary are scarce. This application offers such a solution. Its significance resides in its placement of patient health in the patient's hands and in the streamlining of patient health information into one location easy for the patient to access. Patients will have access to their treatment regimen as specified and entered by their doctor, personally. Patient compliance to physician treatment will be loosely monitored by the physician by means of simple, non-invasive application dialogues. Patient-to-physician contact will be simplified by connecting a given patient's application with a particular physician in the HealAssist network. As a result, healthcare information, treatment and support will be streamlined into one centralized location at which one's physician becomes just a message away and a physician's patients become more transparent and treatable.

Project Background and Related Work

- EMR extension software for at-home healthcare
  - http://www.capterra.com/home-health-care-software/
- "MyFitnessPal" calorie counter and diet tracker
  - https://itunes.apple.com/us/app/calorie-counter-diet-tracker/id341232718?mt=8
- "Fitbit" exercise tracker
  - https://itunes.apple.com/us/app/fitbit/id462638897?mt=8
- "Medication Diary and Drug List"
  - https://itunes.apple.com/us/app/medication-diary-drug-list/id502972232?mt=8

Proposed System

Requirements Specification

Non Functional Requirements

- Internet Access
- Support from applications such as Google Calendar
- API to make Calendar calls from J2EE.
- Each transaction of the patient should be logged in logs without fail
- HTML5-capable browsers like Chrome, Firefox etc., are required
- Instant messaging should be alerted to the physician / patient immediately
- System should be deployable in Tomcat server.
- The database should have tolerance to update and log all the events
- The database should have a regular backups to eradicate patient information loss.
- The system should be recovered with minimal shutdown time when it crashes (it should have high availability).
- System should be understandable to patients from diverse backgrounds with minimal knowledge of computer systems.
- All the errors of the system should be logged.
- System should be compatible with all the modern browsers.
- System should be flexible enough to extend the features in future.

Functional Requirements

- Patient should update / view only his data (access to separate profiles should, ideally, be impossible).
- A physician should only be able to add /update / view his patient's profiles.
- Patient and physician should have an in system chat application.
- Patient should have interface to update his daily events regarding health like exercise, Medication etc.
- Physician should have interface to create the new case of a patient.
- Calendar should be changing according to the patient and physician.
- Database should backup all the data in regular intervals and should restore easily whenever it wants.
- Logs should specify every transaction that happened in the system.

Technological and Architectural Requirements

- Client-Server architecture using java dynamic web project.
- Mockaroo.
- OAuth 2.0.
- Eclipse Juno IDE.
- Apache Tomcat Server.
- J2EE.
- Jersey JAX-RS 2.0 RI bundle.
- Services: Drchrono EHR API, PillFill Developer API, Chrono API for Calendars.
- MongoDB.

Existing services

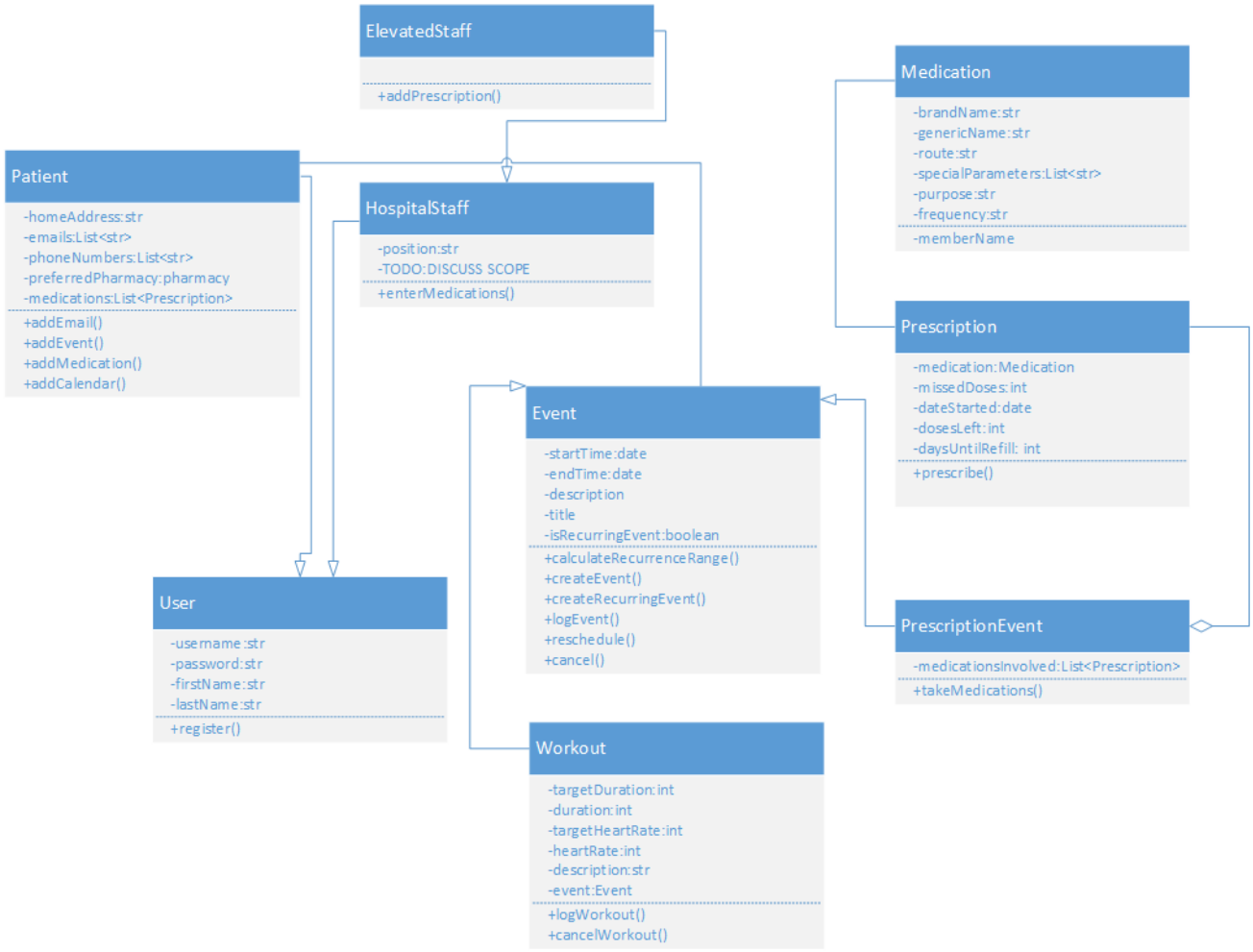
In the existing healthcare organization, if a patient has any health problems then he has to book an appointment first and then wait until his appointment arrives. There is no direct contact with one's physician, and that patient will have to wait for their appointment in order to experience relief from symptoms. There is software which provides a messaging service that enables patients to write instant messages to their physicians/nurses. This causes patients to feel both empowered and truly cared for. But the messaging service may not satisfy the patient when the physician doesn't respond to the message. Our proposed project will be more helpful by giving the patient access to his own health information and by adding additional features that complement the doctor-patient relationship.

New Services

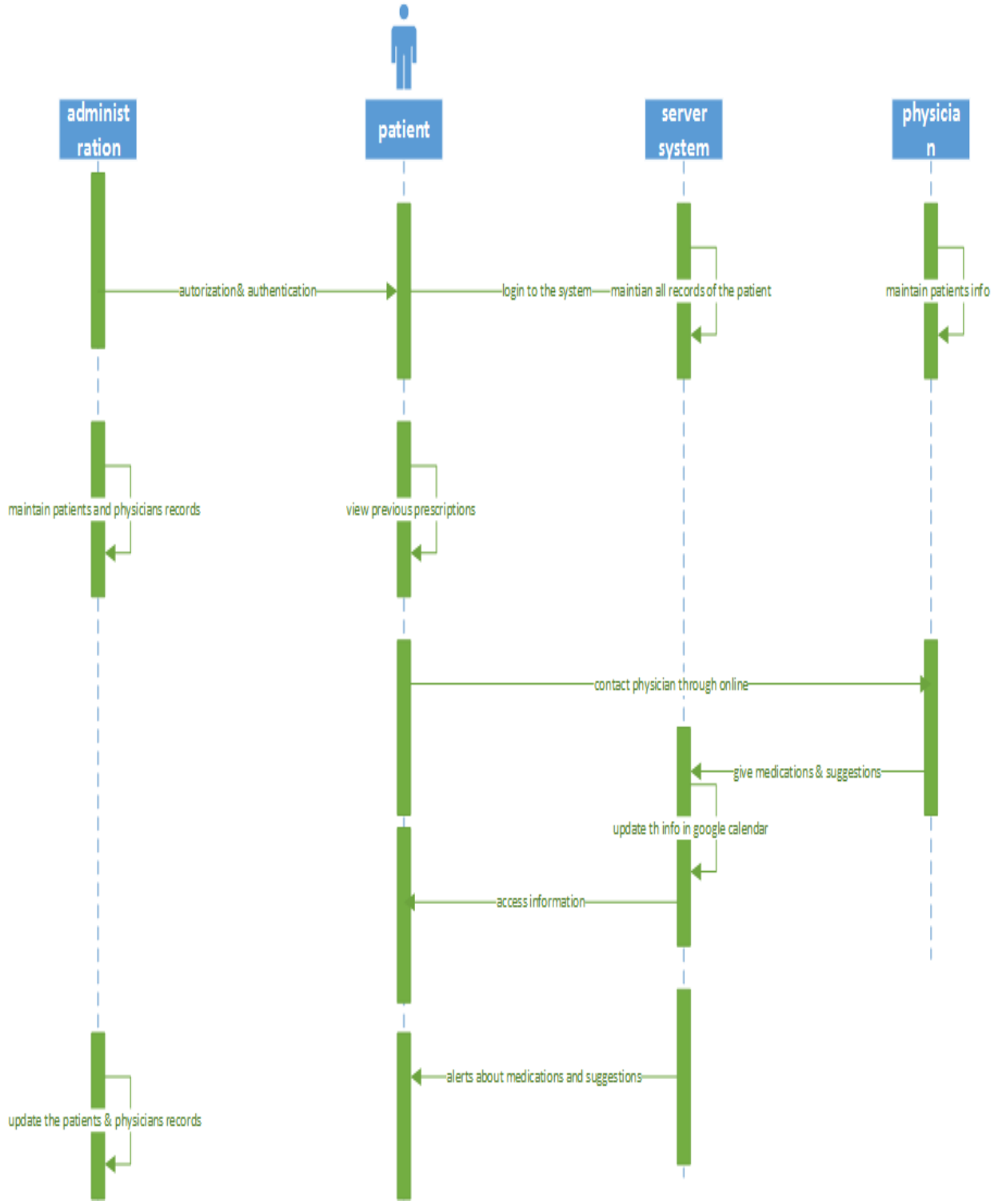
Our project objective is to make patients feel empowered. There is rarely a way for a patient to access their own health data electronically. The only way to access one's personal health information is to maintain their data in hospital devices and to give patients access to store their own records and medications list to the server by logging into the hospital management system. This, of course, isn't likely. However, our solution circumvents this difficulty by allowing patients to view select aspects of their chart, which is updated by hospital staff. This ensures HIPPA-compliance while allowing patients to better track their health. Our solutions features will be, for the most part, geared towards providing the patient several means to improve their health. Medication, exercise, and other features will be stored in the software. In order to track when these activities (taking a medication, going on a 5-mile run) should occur, the patient will have the freedom to log events in their calendar.

For an agnostic calendar event to be created, the patient will fill out a form with a subject, location, start/end times and an event body. The user will then select which calendars to update with the event. Finally, the patient will log whether or not the event occurred and the application will track this information. That way, the patient can see which areas of their health care most can be improved upon.

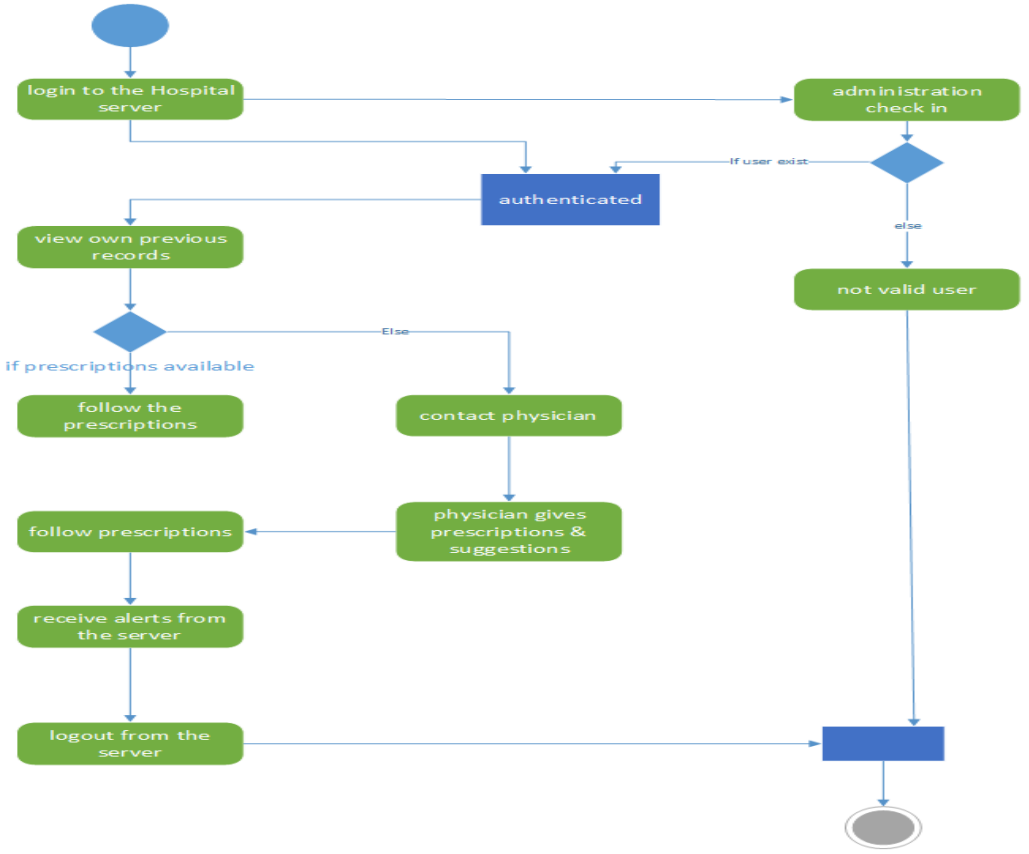
Class Diagram



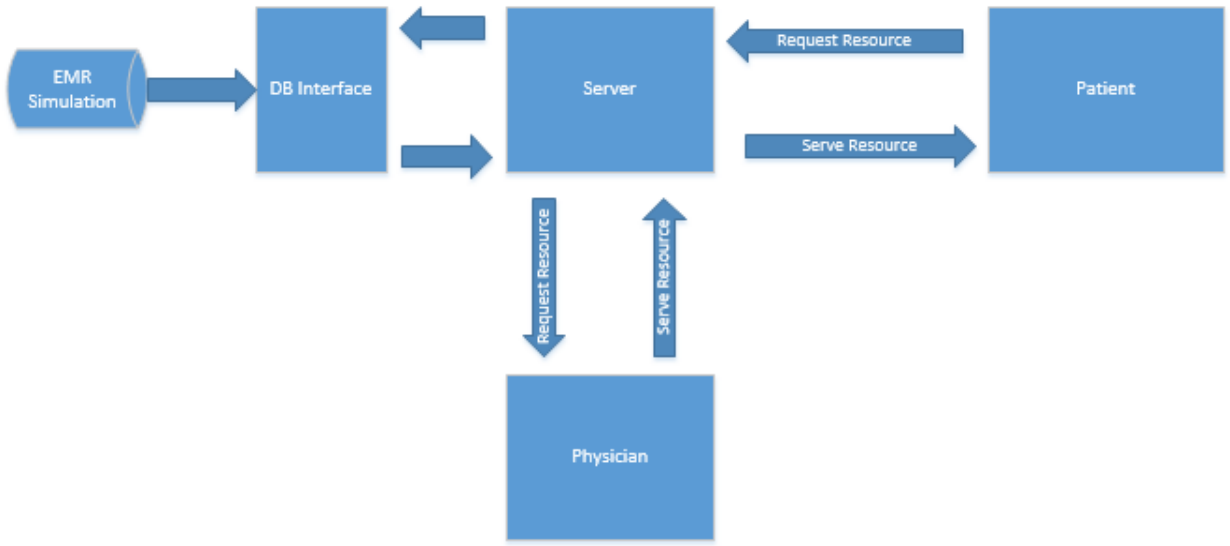
Sequence Diagram



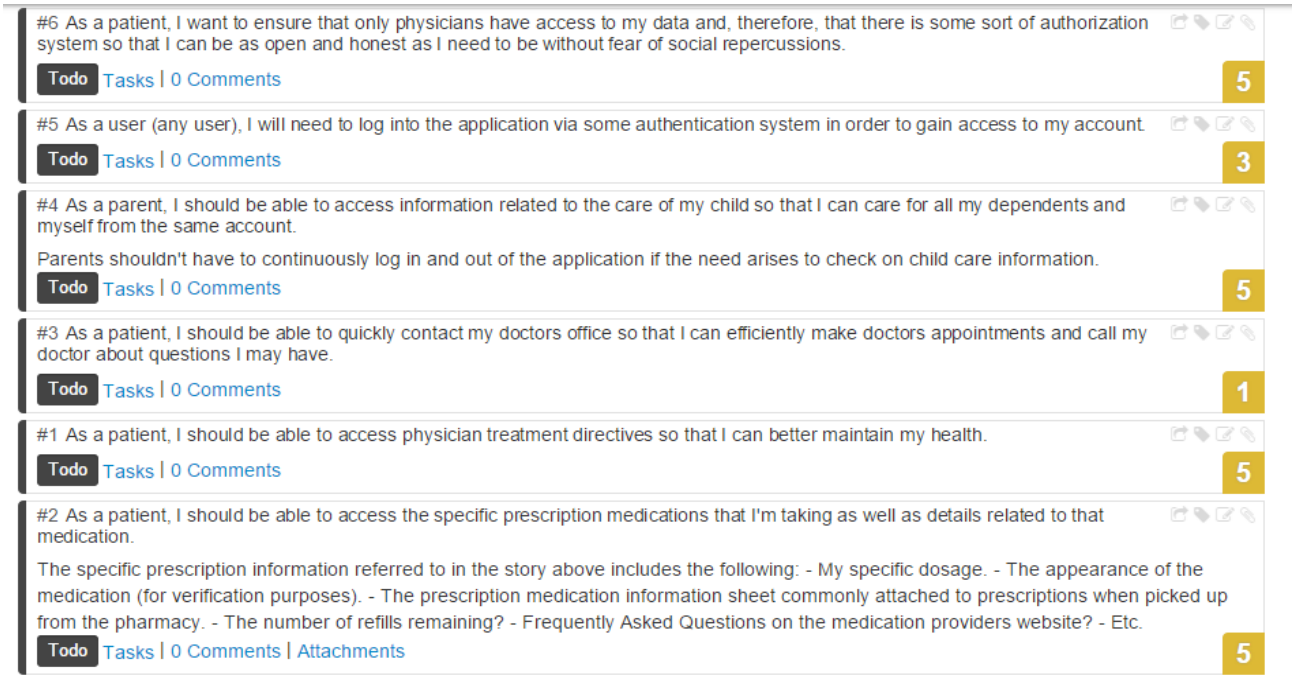
Activity Diagram



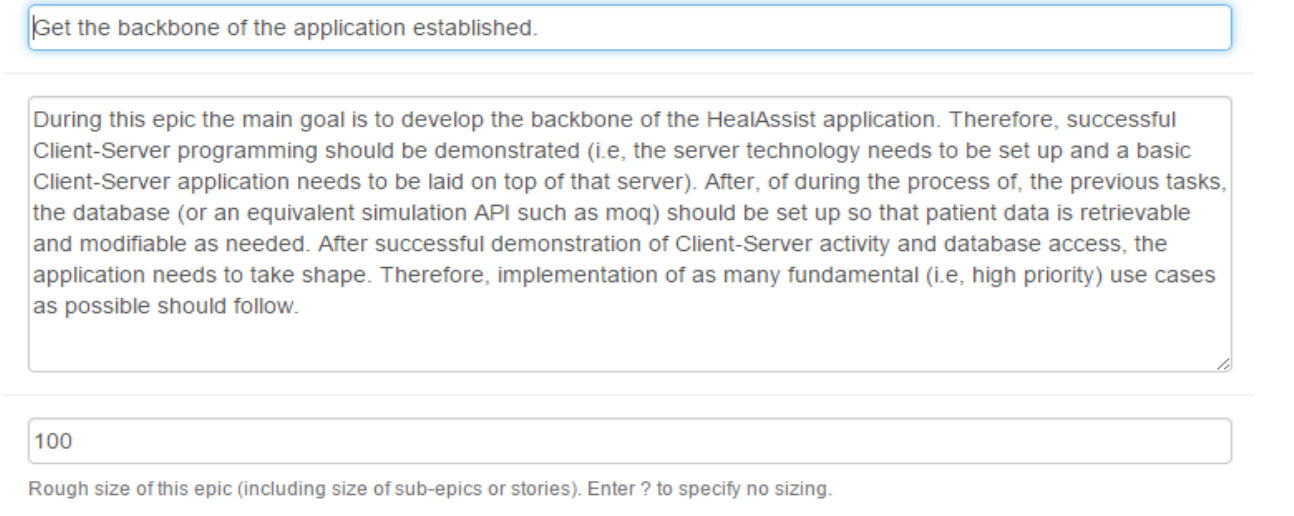
System Model



Scrumdo Use Case Examples



Epic 1 Defined



Risk Management

The constraints present on our system are primarily dictated by the regulation associated with the healthcare industry as well as with certain technologies that we are using to meet our application goals. The HIPPA regulations demand heightened security of patient information and ensured confidentiality, something that's difficult to ensure when passing data through a network. To curtail the risk associated with a breach of HIPPA stipulations, our application is using an API designed specifically to allow such information exchange. That API is the drchronos API. It uses authentication and authorization schemes that ensure patient data is handled in a HIPPA-compliant manner.

In terms of technological risks associated with this project, one such risk is the dependence that our proposed application will have on patient access to the internet. Such dependence means that, without access, our application will lose its value. To nullify that risk our application will utilize off-line storage technologies such as browser-provided application storage, on-device storage, etc. This will allow a patient to access to their data in a protected means regardless of having access to the internet. Furthermore, they'll still be able to contact their physician by means of the application as cellular calls don't have network dependencies that will render that functionality unusable when network access isn't available.