Sprint #2 - Design & Implementation Plan

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***Abstract*—This is our team's design and implementation plan for Sprint #2 for CS 6440 - Intro to Health Informatics. Our selected and approved project is Project #4 - MedCardsWeb Application.**

1 PROJECT SUMMARY

The external mentor for this project is Julien Thomas MD, MPH, of Emory Healthcare. The Teaching Assistant / internal mentor is Abhishek Khowala. The domain is Electronic Health Records; the Unit of Focus is "Health Interoperability & Tools"; and the Primary Topic is "Healthcare Technology, Tools & Scripts".

Among the many challenges involved in providing high quality healthcare in today's healthcare system is the administrative obligations of a physician as well as the rapid manipulation of large amounts of data. Physicians and medical administrators often spend hours on an inpatient service attempting to organize and assimilate this information in order to make decisions about providing appropriate care. An advantage of the Epic Electronic Medical Record is the ability to search through the medical record for a topic which can be helpful; however there are limitations.

We seek to create an application that both organizes only the data appropriate for a particular specialty based on chief complaints, and also integrates clinical tools to save time and cognitive energy. For example, it is important for our external mentor to have the laboratory risk factors as well as the interpretation of certain procedures as well as risk factors from the patient's history all easily at hand. An application that could accomplish what was described above, preferably with the portability of FHIR would do wonders for improving efficiency and likely quality of care provided by physicians while also decreasing burn out.

Additionally, it would help align the goals of physicians and hospital systems by providing a reason for physicians to pay more attention to the ICD codes that determine billing, if such codes were also being used to drive an application such as the one above- i.e. a data summary or MedCard specific to a certain diagnosis-related group or ICD code. Following HIPAA regulations will clearly be very important in creating this application.

2 TOOLS AND TECHNOLOGY

- Hardware for testing: Iphone and/or Android devices and simulators
- Backend: Java or Python
- Frontend: Xamarin, C#, Visual Studio
- Data Storage: MongoDB, JSON, or other
- Public Cloud Environment: AWS, Azure, or GCP
- FHIR API or FHIR Server or EHR system

3 DATA SOURCES

The data sources that we will use for this project are slightly unclear at the moment. The reason for this is we have only had 1 meeting with our mentor Julien and it is unclear if the FHIR servers provided by Cerner and/or the Smart-on-FHIR will provide data that we can use for this project. In light of this uncertainty we can say that we are going to use some combination of FHIR, our own mocked data represented as JSON files and/or a database such as MYSQL or Mongodb. We will likely know later in the week or next week exactly what/how we are going to use data to satisfy the requirements for this project.

4 DIAGRAMS

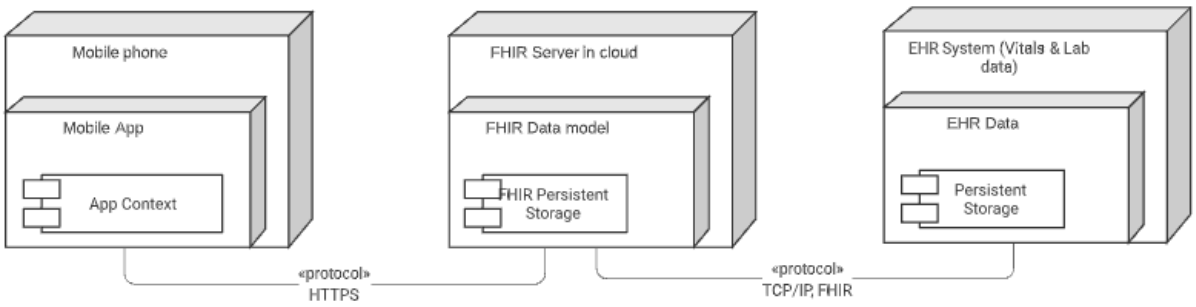

Figure 1 - Deployment Diagram: MedCards Web/Mobile Application

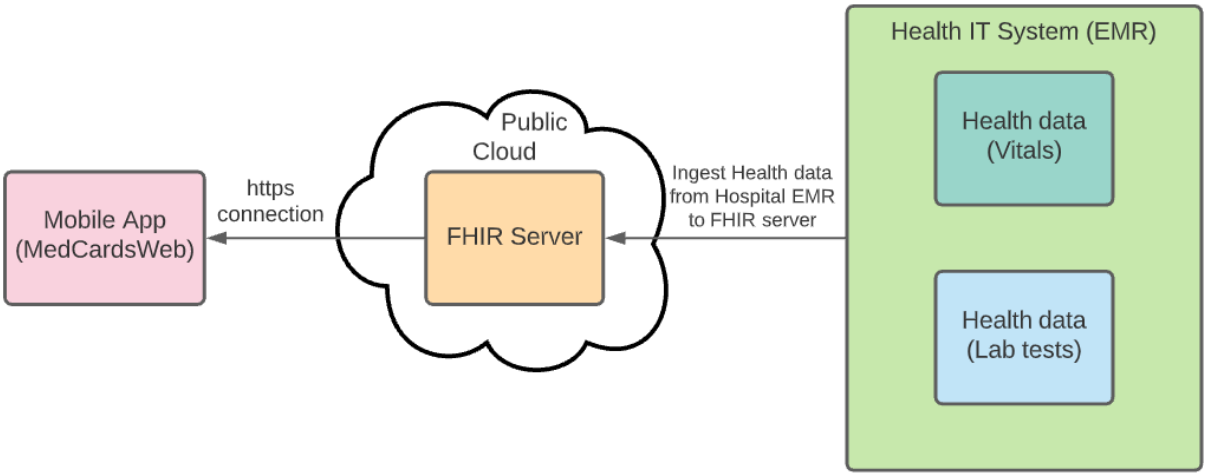

Figure 2 - Component Architecture Diagram

5 SCREEN MOCK-UPS

The following mockups were generated using hard-coded values derived from the example MedCard document provided to us by our external mentor, as well as our first conversation with our external mentor. These mockups were generated using a simulator for an iPod touch (7th generation) on iOS 14.4.

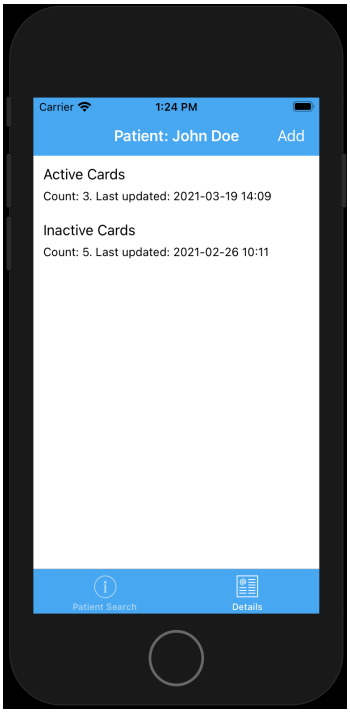

Figure 3 - List of Card categories (active and inactive) for a given patient

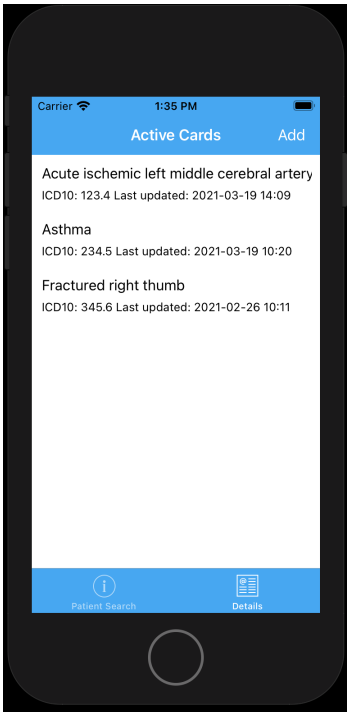

Figure 4 - List of Active cards for a given patient

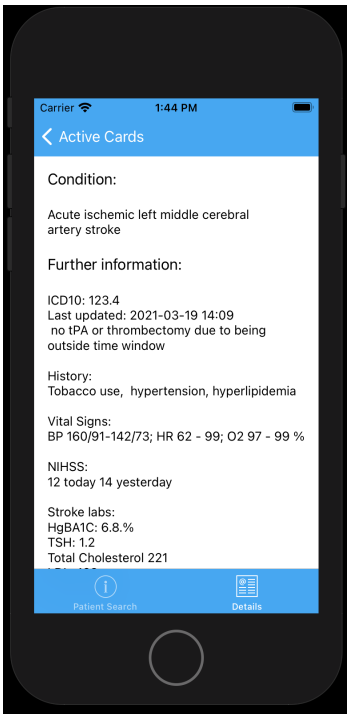

Figure 5 - Details of a selected active card