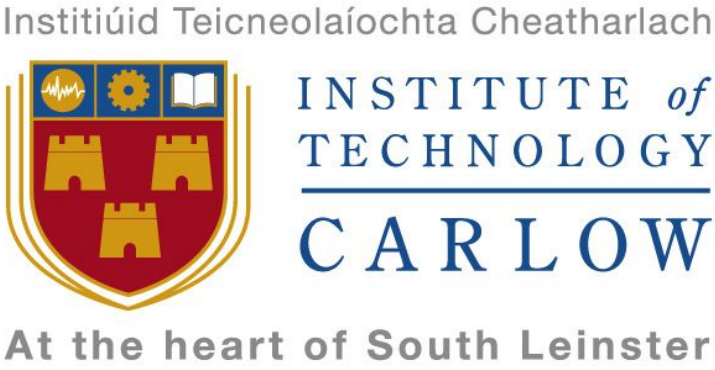
The Ardú Project

Final Project Report

30th March 2016



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Abstract

The document explores the design of a clinic data management system, Ardú. The Ardú clinic is a local substance misuse clinic and the system is specifically designed for carrying out routine procedures on the cloud. This project aims to provide a proof of concept application for Ardú and other small to medium clinics operating under the same functions. The outcome of this project is a web application which provides clinic users a means of integrating with clinic records all in one place at any time.

Acknowledgements

I would like to express my deepest thanks to all those who made this project possible. In particular I would like to thank my project supervisor, Paul Barry, whose guidance and insight throughout the iterative process helped significantly. I appreciate the help of all lecturers involved in supervising projects for their involvement in presentations and providing feedback. Finally I would like to thank Deirdre Barry for the time she has given me during my research/requirements gathering phase of this project.

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1 Introduction

1.1 Motivation

Over the past years the advancement of technology has been very significant with applications. Health Care has embraced these advancements with the goal of increasing efficiency and improving care. The lack of software systems which are designed for substance misuse clinics all over Ireland is my motivation for this project.

Therefore there exists a need for an application which can assist clinic users to deal with patient records electronically. It was brought to the attention of Paul Barry, my project supervisor that Ardú was exploring the possibility of a system for their needs.

The clinical data management system I propose is a web application hosted on the cloud. This is optimal for this type of application as it offers increased accessibility to treatment, all in one place.

1.2 Objectives

The goal of this thesis is to create a web application to assist clinic users in their daily procedures, which will help the overall efficiency of the clinic itself.
The goal will be achieved by completing the following objectives:

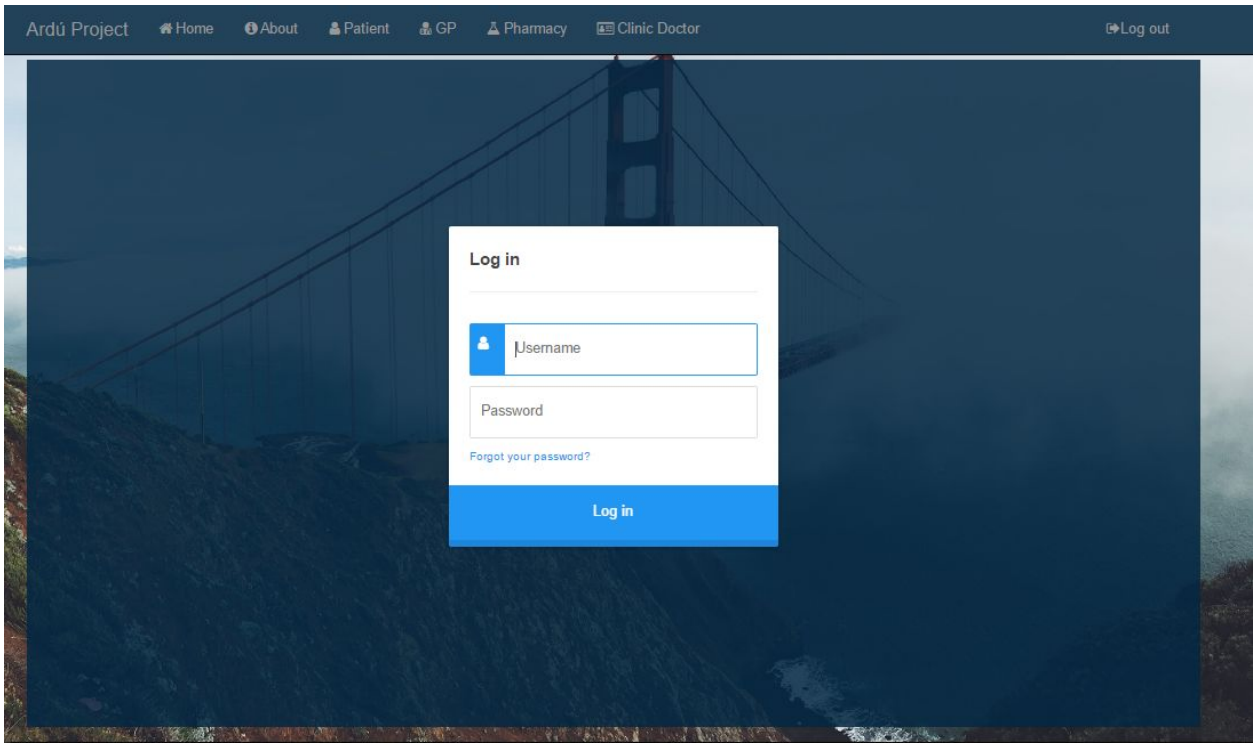
- Login securely
- Create new records for Patient, Pharmacy, Clinic Doctor and General Practitioner.
- View all Patient, Pharmacy, Clinic Doctor and General Practitioner records.
- Implement a Clinic Events module.
- Implement a Patient Treatment Protocol module.
- Implement a Phlebotomy module.
- Implement a Vaccinations module.
- Implement an audit trail module.

2 Project Description

2.1 Final Product Description

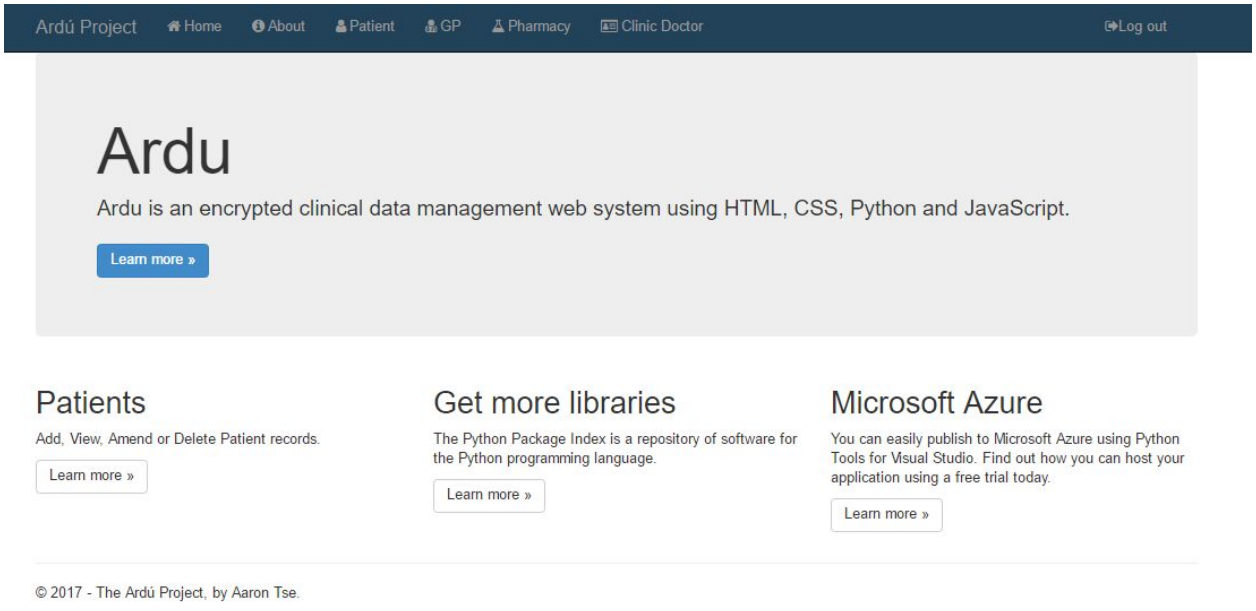
The Ardú clinical data management system is designed as a web application and utilizes web technologies. The application itself is called Ardú, its core functions is to assist users in creating electronical medical records. It provides a means of creating Patients, Pharmacies, General Practitioners and Clinic Doctors.

2.1.1 Login Screen



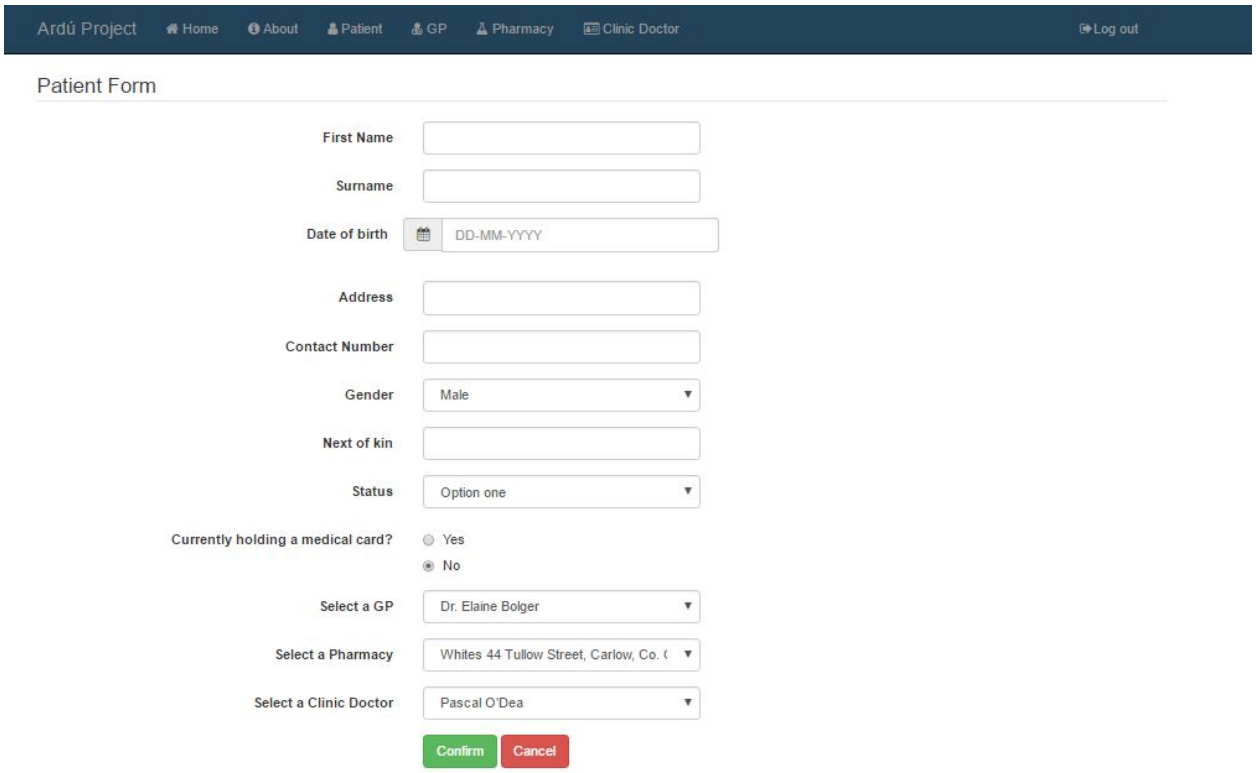
The Login Screen is the default window you will see when the URL for the application is reached, allowing the user to sign in using their login credentials.

2.1.2 Home Screen



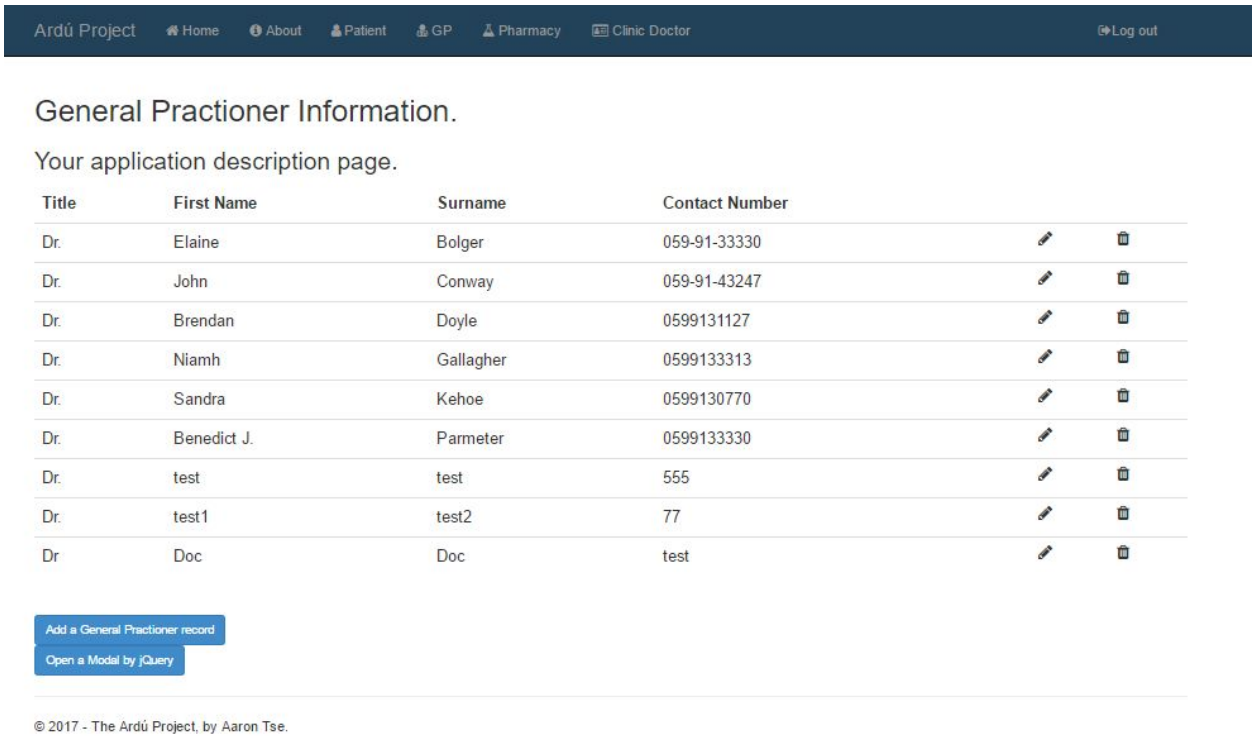
After a successful login this is the first screen that will be presented to the user, the Home Screen. On the top you will see a navigation bar that allows a user to access all features of the application quickly and easily.

2.1.3 Patient Form Screen



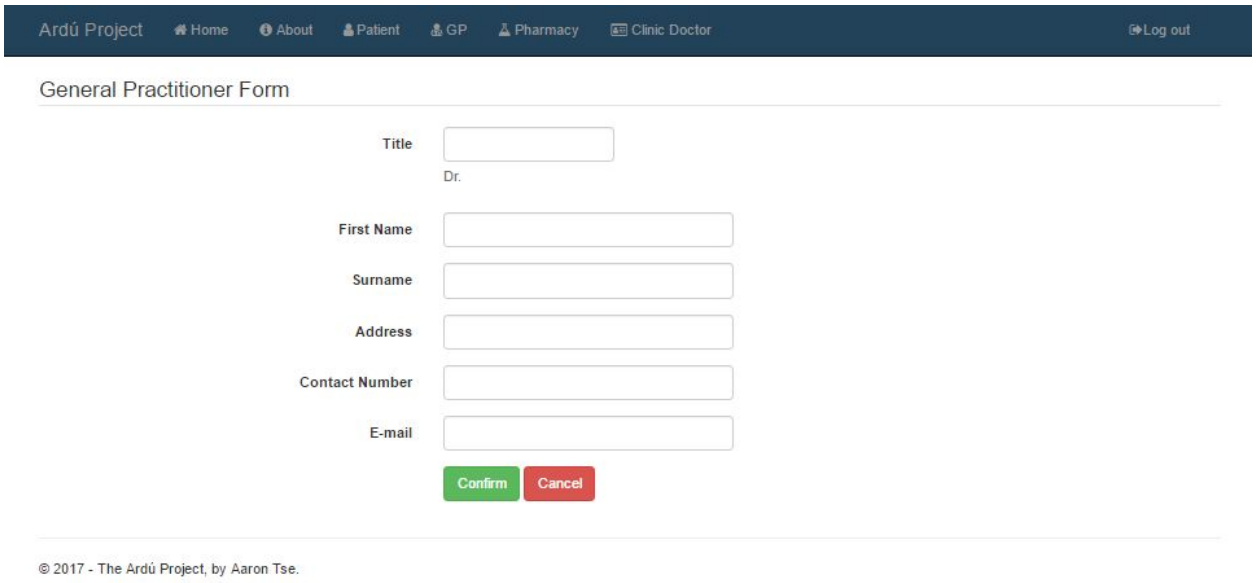
This is a new patient creation form. It can be accessed once the user is logged into the application. From the navigation bar a user selects Patient to view all patients, then the user has the option to create a new patient. This form contains the relevant information for creating a patient, associating one with one General Practitioner, one Pharmacy and one Clinic Doctor.

2.1.4 General Practitioner Information Screen



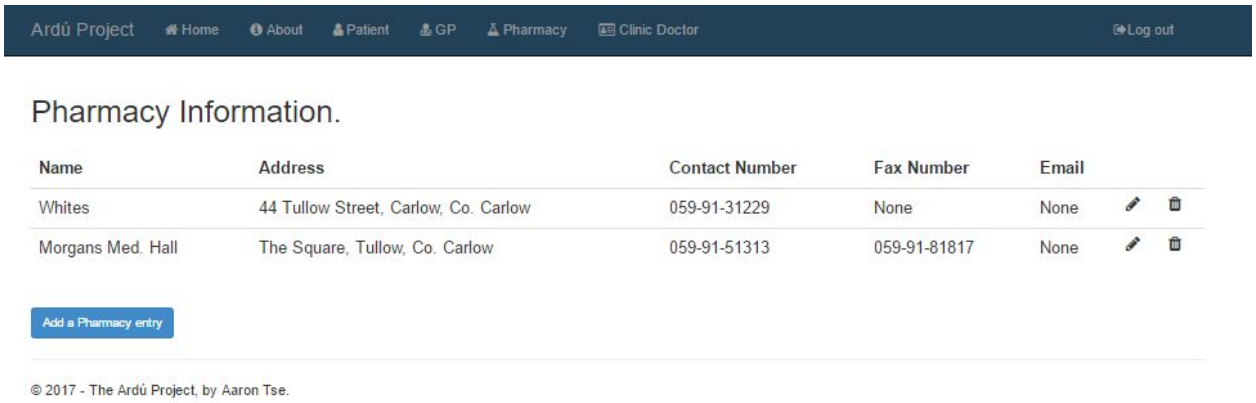
This screen is accessed directly by clicking on GP from the navigation bar. Here the form loads all existing General Practitioner records.

2.1.5 General Practitioner Form Screen



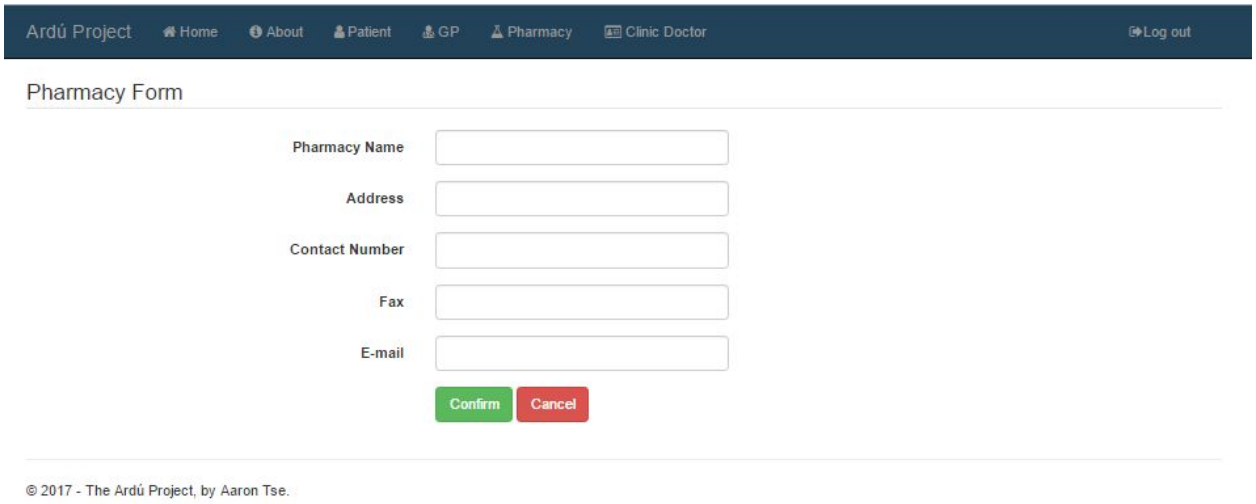
From the General Practitioner Form Screen this screen can be accessed by selecting the option to create a new GP record. This is the relevant form for creating a GP.

2.1.6 Pharmacy Information Screen



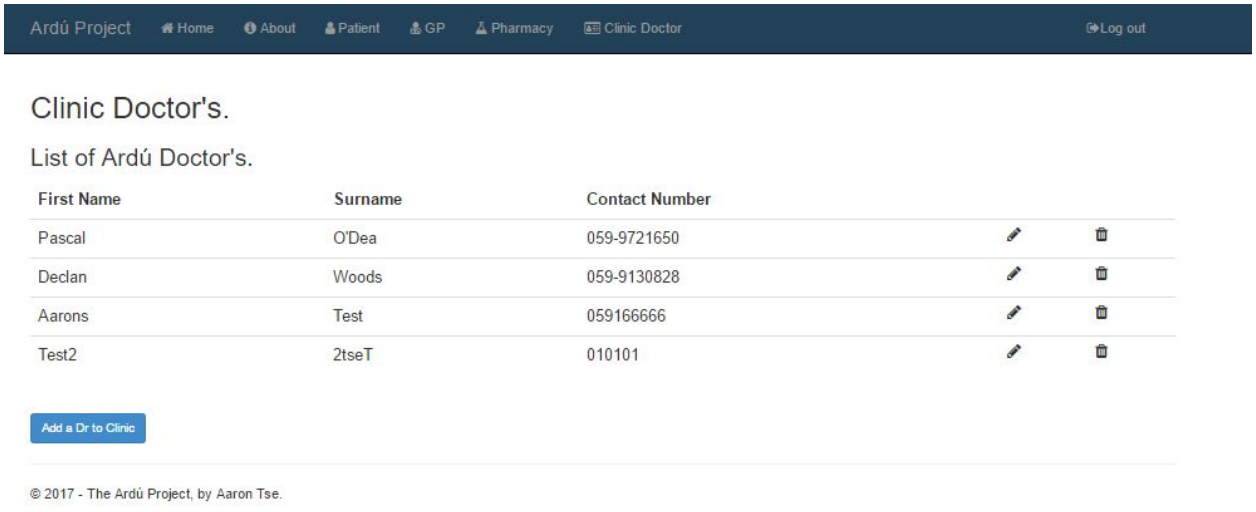
This screen is accessed directly from the navigation bar. It gives the user a view of all Pharmacy records saved to the system.

2.1.7 Pharmacy Form Screen



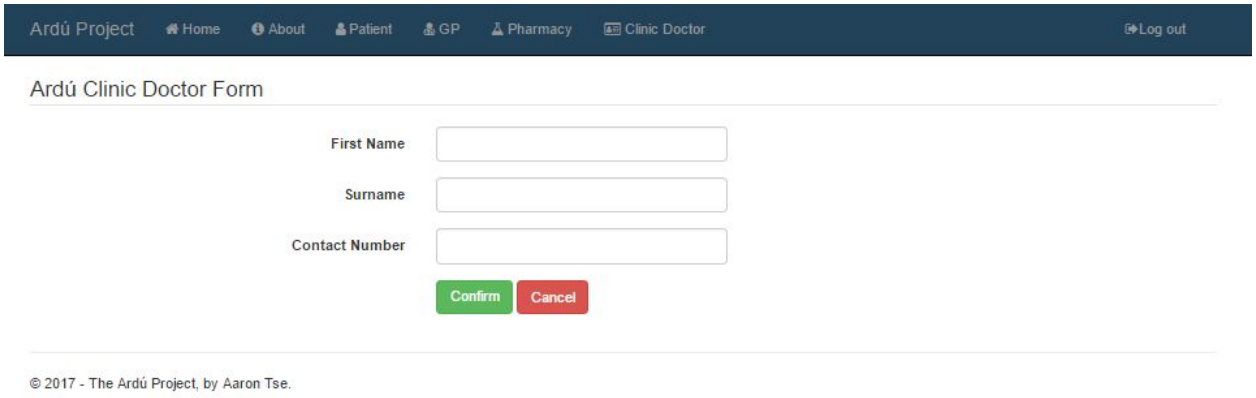
This form is accessed via a button on the Pharmacy Information Screen. Here assists the user in creating a new Pharmacy record.

2.1.8 Clinic Doctor Information Screen



This screen is accessed directly from the navigation bar. It lists the user all Clinic Doctor records.

2.1.8 Clinic Doctor Form Screen



This screen is accessed via the add new doctor record button from the Clinic Doctor Information screen. A Clinic Doctor relates to the Doctor's functioning inside of Ardú.

3 Conference to Specification and Design

During this project I tried to keep to the specification and design as much as possible however I failed to implement some feature due to starting this project at a late date and time constraints thereafter. The submitted application is not as polished as I would have liked to have got more work done on the design and other features from the specification.

4 Description Of Learning

4.1 Technical Learning

4.1.1 Python

As the target platform for this application was the web, I felt the best choice was Python and from previous projects I could extend my knowledge of the Model View Controller design pattern. Starting September, 2016 was my first time learning the Python programming language, since then I have come to learn a lot about this general-purpose language.

4.1.2 Database design in conformance with encryption

During the course of this project and working on prior assignments that required or focused on encryption I have had the chance to learn a great deal about it. Research on this topic can be

difficult in terms of industry standards, what are companies using to keep their data safe, what should I do as a developer to keep my data safe. These are questions that arose during Iteration 2 for me while I was in the design phase of Ardú.

4.2 Personal Learning

4.2.1 Time Management

Time management was one main problem factor and learning outcome while completing this project. The project started right at the end of the first iteration leaving meaning time was of the essence. It was crucial for me to exercise plans and marking items of work with available time to make any progress. Knowing when to allocate time on this project or others was necessary throughout the project's lifecycle. From this project I feel in future I can utilize my time more effectively from the outset.

4.2.2 Self-Motivation

As any person must accomplish when working on a project that spans over a couple months, self-motivation was of a daily habit. Looking back over this project there were times when I felt the amount of work remaining would be impossible to finish. The space in my mind for creative touches on UI, coding practices and all else never stopped sparking. At times it was difficult to focus on what are the important features I have to complete rather than what I would like to do. Nonetheless, keeping myself motivated when things got difficult was necessary in moving forward with this project.

5 Review of Project

I feel that this project was one of the biggest challenges I have faced in my time as a developer and possibly one of the best experiences. It allowed me to put into practice what I have learned throughout the years.

5.1 What went right?

First of all I would like to say I am happy with what I have achieved over my time on this project. The most rewarding phases for me were requirements gathering and design. For a college project it felt very professional to me, having met with a member of the Ardú clinic to discuss functionalities of a desired system and to explore her everyday processes as a nurse. Paying attention to what the customer said and needed was crucial to make this application work. Although of course Deirdre could not be present for project presentations, feedback be it negative or positive is essential to guide developers along the right path into creating a successful system.

5.2 What went wrong?

As mentioned previously, this project started late, more accurately it started on the 30th of January. At the beginning of the year at the stage where decisions were being made on projects I too had mine settled. My first project decision was to create an system for Python developers to use for pushing code to PyPI. This was to help break the long processes that come with publishing and maintaining packages. About two to three weeks into this project I found an open-source github project tackling the same problem. Because the problem is unique for developers and this project had a number of contributors I was forced to change project.
The next project I chose unfortunately had the same consequences. I was looking at a Python technology named Scapy and my goal was the port this package from Python 2 to Python 3. After two weeks of deep diving into research I also found a github repository with hundreds of contributors from around the world working together to get this package ported. It was at this time when I picked up the need for the Ardú project.

5.3 What could have been better?

Due to the rather short duration of the project I had to start using relatively new technologies for me without much time to learn them in whole prior to writing code. One of the most difficult concepts for me was the change of frameworks and technologies I am comfortable with. My experience with software development has progressively been focused around web technologies. Most of my professional experience revolves around these technologies. Mainly JavaScript and JavaScript libraries such as AngularJS and Node.js.
With that said, that is the reason why I chose Python. I aimed for taking myself out of my comfort zone and learn to develop a sophisticated web application using the Flask framework. This decision I made I am happy with, it was an experience that will stick with me until further updates to the language. WIth regard to the application itself, because Python is incapable of manipulating with DOM elements as such, certain requirements of the application became convoluted to me. With all honestly I feel if I tackled the application using a JavaScript approach I would have accomplished a lot more that I did in Python.

If I had more time on development on the project as is. I would certainly add testing elements such as a web based GUI testing tool like Selenium. I would also add some web testing tools like webunit or webtest.

5.4 What work is outstanding?

To date the work that is outstanding includes:

- A clinic event module
- A patient treatment protocol module
- A phlebotomy module
- A vaccinations module