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Capstone Development

Final CS231: Proposal Draft

Objective

There are two main objectives in our capstone project. The first stage object for our project is developing an application for the nursing program that can replace their current system of Word pages which is very hard for the students to work with. The second objective is to develop an intuitive, user configurable Cloud based electronic records management system. That allows for highly secure access to patient records anywhere without getting into healthcare providers way. At a price that will allow for wide scale deployment to even the smallest provider.

Motivation

The first motivation behind all of us wanting to do this for our capstone project is because we were told that the nursing program was needing someone to create an application for them to use, and we agreed to work together on creating said application because the current system struck us all is very poor and something we felt we could make noticeable improvement to for them. The second motivation was that current ERM software and processes are extremely inefficient. Requiring huge amounts of providers time to enter a relatively small amount of information; leading to missing, incomplete, or even fraudulent documentation of vital medical records. That could mean the difference between life and death. By optimizing the work flow we hope to reduce the amount of time documenting to the minimal amount possible without sacrificing details or accuracy. If we are successful healthcare providers will be able to spend more time with patients and less time fighting their computers.

Tasks

Alec - For tasks that I've done on my part of the capstone project was mostly setting up the database and creating tables for the application to connect to and grab data from. I've also worked on the patient summary page that summarizes the patient's information.

James - Lead the initial development for our front-end design using Xamarin and did research into exist EMR programs and regulations regarding patient records requirements.

Mike – Worked on setting up all need server software and initial development tooling setup need for the project. Additionally, start work on code for role-based access control modeled after existing open software. Worked with team mates to help get them up to speed on working with common source control and remote Linux development we'll be using.

Going forward we have discussed using a system of 2-week sprints to have firmer commitments on have work done that can be present and review by other team members and other stakeholders in the future. With the needed project infrastructure largely in place all team members should be move to more active software development and away from other activities. It is expected that some members of the team will be more involved in the different areas like the server PHP development, database queries and frontend client HTML, CSS, and JS but it is hoped that we will all learn at least a little about all aspects going forward so everyone has a more rounded programming knowledge base and understand of project management which will be helpful going forward in our future employment.

Challenges

The biggest challenge so far that we had was deciding on how we would create our application: first four weeks in and we found using [Xamarin](#) was going to be difficult, so we agreed that we will use an HTML webpage that connects to our server to grab data from. We have since decided to switch to [Electron](#)

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developed by GitHub that will allow using HTML, CSS, and JS but still deploy a client application. Another challenge that we had was if we should be trying to get our application to meet the local hospital's requirements, and we decided that it would be better if we were to focus on getting it to meet the college's requirements and worry about everything else after capstone. Some other challenges that we had were only just decisions on what programs that we will be using to create our application both easily and effectively. On ongoing challenge will be keeping the scope of the project from grow beyond what we can complete within the time we have.

Timeline

So far where we are at now is mostly setting up the server and repository for us to work with in the future. One to three weeks into the future we plan on trying to get the basic layout of the application client side of it, so we then can do more work on the server side of the application once the user-interface is more developed. We do plan on sometime that we'll show a demo of our first version of the application, so we can receive feedback from the nursing program to improve the application. Throughout the second quarter we will be trying to contact the nursing instructor more so that we can have them look at what we currently have and ask questions so we can create the program to fit their needs.

Related Works

The EMR software field is very much in flux with many companies and groups developing software for the market. The market has seen a lot of grow in the last few years as new health care rules and regulations by the Federal Government has come into existence to make all medical records electronic and easier to exchange between providers. There is also government money available to health care businesses to help them switch to EMR system and away from the largely paper record many of them have been using that many are hoping to cash in on. The local Walla Walla hospital uses software sold by Epic which has been involved in the medical software business starting back in 1979. According to the company the hospitals that use its software hold 64% of patient records in the US. On the other end you can find open source projects like open-EMR which is hosted on SourceForge and can be downloaded and used for free. I wasn't able to find any market share numbers for it, but they do have multiple professional support providers world-wide which is unusual for most specialty open software projects.

Future Work

For future work on this application, we plan on improving the program so that it would meet all the regulatory requirements and needs for the local hospital and other health providers as a possible new business and product we can sell going forward.