LibreHealth GSoC Proposal

Incorporate reporting workflow into Radiology

Project Proposal

BY

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First let me introduce myself. I am Oguzhan Yildirim, 24 years old and i am from turkey and i am studying computer engineering at Mugla University. This year i will graduate from my University. I am not a native speaker but while studying i also try to improve my english skills so if i make misspell i am so sorry about them.

1. Introduction

As previous Radiology Reporting project refers radiology reporting forms the basis for most clinical diagnosis thereby making it important sector in the clinical eco-system. LibreHealth Radiology provides perfect application for Radiologists and makes it easy to do Radiologists functionalities so Radiologists should be able to follow entire workflow and do their jobs. The module i still under development.

The radiology module currently have MRRT templates and Radiology Reporting implemented at previous GSoC projects so users can create Reports with MRRT templates but reporting process for the radiologist begins after selecting the "Claim Study" button so the goal of this project is to make it possible for radiologist select a template, dictate the report, sign the report and send a copy to the EMR and the PACS system.

2. Current State of Things

The radiology site loads all the studies being performed through the OHIF viewer but after clicking button "Claim Study" application says "Patient not found. Are you sure you want to create a matching patient to claim the study?" so i take look at a topic from LibreHealth forum

"https://forums.librehealth.io/t/radiology-demo-has-been-updated-with-the-ohif-dicom-viewer/2368"

and i see LibreHealth using

 "https://docs.ohif.org/"

website and here i see how OHIF DICOM viewer works. OHIF DICOM viewer should show images that US machine send through PACS system and Radiologist can dictate the report with using dictation software that implemented last year GSoC project

"
https://forums.librehealth.io/t/project-implementing-reporting-workflow-for-radiology-as-an-open-web-app-and-integrating-voice-dictation-for-radiology/2343/19 "

And about selecting MRRT templates i take a look at

"https://forums.librehealth.io/t/gsoc-project-radiology-reporting-enhancements-continuation/817"

GSoC 2017 project so we can use "OpenMRS API Complex Obs" to use MRRT reports and save MRRT reports.

3. Improvements

We can modify OHIF DICOM viewer appearance.

I am still thinking about possible improvements but currently i am new at LibreHealth Project so spend my time on understanding key concept first.

4. Deliverables

Radiologist should be able to use OHIF DICOM viewer when clicks "Claim Study".

Radiologist should be able to use Dictation Software so he/she able to dictate report.

Radiologist must be able to sign report.

After radiologist sign the report system should send a copy of report to PACS and EMR system.

We should create a dictated list and user must be able to review the results.

5. Implementation

User must be able to select templates so we should create a java class for Radiology Templates with an templateId but as the previous GSoC project suggest

"[https://docs.google.com/document/d/1ZcSVT9PwlfBbu8YV8afN4AfZ4Wr YwTYSygSksutzQ4k/edit](https://docs.google.com/document/d/1ZcSVT9PwlfBbu8YV8afN4AfZ4WrYwTYSygSksutzQ4k/edit)"

If it is possible, we can go use FHIR REST api and we can communicate via REST calls.

After selecting template we should go for dictating the reports process,

We have an available Dictation Software , i spend some time to understand previous GSoC project

"**Implementing Reporting Workflow for Radiology as an Open Web App and Integrating Voice Dictation for Radiology**"

Then i understand Radiology module using Sphinx4 for speech recordings and it provides a quick and easy API to convert the speech recordings into text with the help of CMUSphinx acoustic models so system must be able to create REST calls to Dictation Software and we should store them in a report.

About sign in report, I am not sure how to sign the report but i should discuss it with mentors. I guess we will be using user's name and surname and a checkbar that shows signed.

And system should be able to send a copy to EMR and PACS system so i guess we can create our java classes and store them then we can send a copy to EMR and PACS system with REST calls but i have some lack of

knowledge about FHIR server but if it is possible, we can also use FHIR server to sending reports to EMR and PACS systems.

After study finished, there should be a dictated list again it depends on how we store this reports but i guess FHIR will be our point.

6. Timeline

Community Bonding

6 May - 27 May

-Getting familiar with community

-Improve knowledge on FHIR server, MRRT templates, Dictation Software

-Discuss in detail proposed solutions and get approval

-Do some other needed research and discuss timeline with mentors

Coding Phase 1

May 27 - June 3

-Allowing users to reach Templates via FHIR server and fill them, if needed using validator for MRRT templates

June 3 - June 10

-Creating UI components for template part and managing who is authorized to reach UI.
-After filling templates storing the state of report

June 10 - June 17

-Allowing user to use Dictation software via REST calls.
-Store dictated text in report state

June 17 - June 24

-Testing changes so far
-Get feedback from mentors and community
-Submit Phase 1 evaluation

Coding Phase 2

June 24 - July 1

-Allowing user the sign report and making it complete state.
-Creating UI for Dictation and Signing part and managing who is authorized to reach UI.

July 1 - July 8

-Testing changes so far
-Get feedback from mentors and community
-Submit Phase 2 evaluation

Final Coding Phase

July 8 - July 15

-Sending singed report to EMR and PACS system via REST call
-Creating UI for dictated reports and allowing user to review it.

July 15 - July 22

-Allowing the Radiologist to use ACRAssist framework

Final Week

July 22 - July 29

-Testing changes so far
-Get feedback from mentors and community
-Fix issues
-Update docs
-Submit mentor evaluation

Post GSoC

-Continue contributing to LibreHealth projects
-Mentor GSoC 2020
-Help the community

Other Commitments

None, I will have exams at June but i have only 4 lessons but they are not problem and i will graduate this year so i have a final year project and i will complete it till June 1 and i like working with java and springboot so this project will not be a problem. I can work both till June 1. After June 1 i am all free.

About me

I want to share my personal interest on computer science. I really like working with Microservices and i read some codebase of open source microservices projects and try to improve my skills and i join several projects but i didn't contribute yet but i am looking spring projects first-timers-only tag everyday and trying to find opportunities. I spend my time on university learning Java language, Design Patterns, Spring Framework(Spring boot, Spring Data, Spring Cloud, Spring Security, Spring Cloud Dataflow, Spring Integration and Spring RestDocs) i also try to improve my skills on DevOps especially Docker and Continuous Integration and i am big fan of Jhipster project and i am really active at Jhipster project and i am planning to write tutorial on (https://www.spingular.com/) website. This website is best place to learn for new developers but i haven't got any prior experience on those skills expect my internships. I made some demo projects on those technologies and you can find all of them on my personal github page. Nowadays i spend all my time to create my final year project called Poseidon. I am trying to create 2 microservices(Search Service for IMPA codes, Customer Service, Customer API gateway) and i am using react/redux for MVVM framework with TypeScript. I am not sure i may missed something but you can ask everything to me via my email and i will share my account links on several websites.

GitHub = https://github.com/Oguzyildirim

Twitter = https://twitter.com/OguzhanY19

(I am trying to be active on twitter and following best developers around the world.)

LibreHealth = https://forums.librehealth.io/u/oguzhan

Actually my main idea is be a good member for community and the real job is start after GSoC project. During my student period i used a lot of Free Software and i am an active ArchLinux user so for me it is honor to be a member one of them. LibreHealth includes all my interest and with GSoC it is great opportunity for me to start this perfect community.

University: Mugla Sitki Kocman University(http://www.mu.edu.tr/)

Program: Computer Engineering

Skills: Java, Spring framework, Microservices, ReactJS, SQL databases, Elasticsearch, HTML/CSS/JS/TypeScript.

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