

Sprint 2 - Design and Implementation Plan

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1 DESIGN YOUR PROJECT

1.1 Project Summary

The project is an application to help patients calculate their risk for chronic diseases, specifically coronary heart disease. This project will be a SMART on FHIR application and take existing patient data to compute an individualized and personal risk calculation. The risk calculation is based on the Framingham risk score (Viera, 2010) that was based on Framingham heart study. If there are any data points missing in the patient data that are needed, a question and input field will be provided for the user to fill in missing details. Aggregate risk factor data will also be used to compare the calculated result with the average demographics. This comparison will be shown either as statements or visualizations in the form of charts or graphs. This will help the user gauge their risk and take appropriate actions if needed.

1.2 Tools and Technology

- HTML
- Node.js
- React.js
- Material.js
- Charts.js
- FHIR client
- SMART App Launcher

1.3 Data Sources

Patient data will be gathered from the SMART on FHIR api through the SMART App Launcher used to deploy the application. This will give mock patient data to work with. The data calculation comes from the Framingham Risk Score, and the aggregate risk of coronary heart disease within demographics will come from a journal from the American Heart Association.(Pekka, 1999) This journal details many tables of risk of coronary heart disease separated between sex, and age. These two variables will be used to compare with the patients demographic

and visualize.

1.4 Diagrams

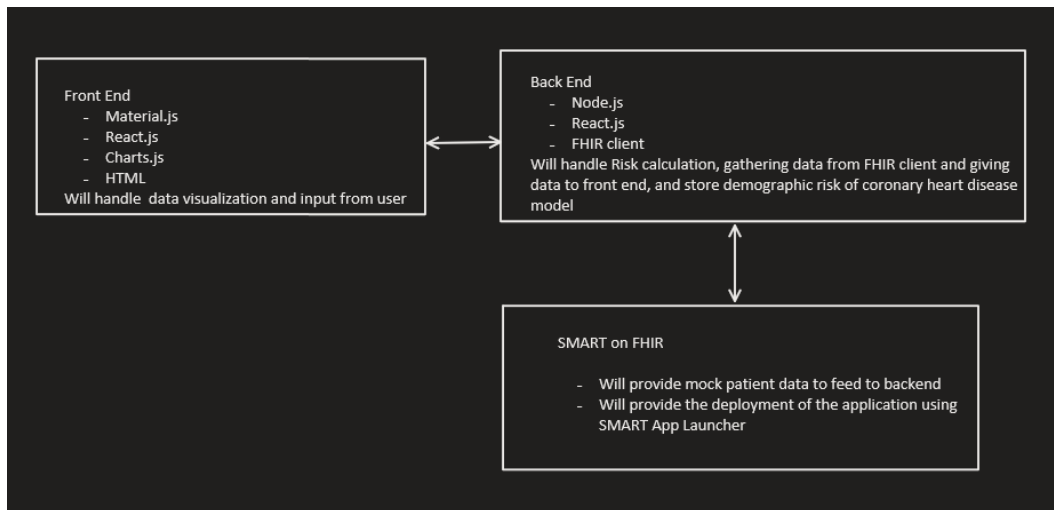


Figure 1—Software Architecture

1.5 Screen Mock-ups

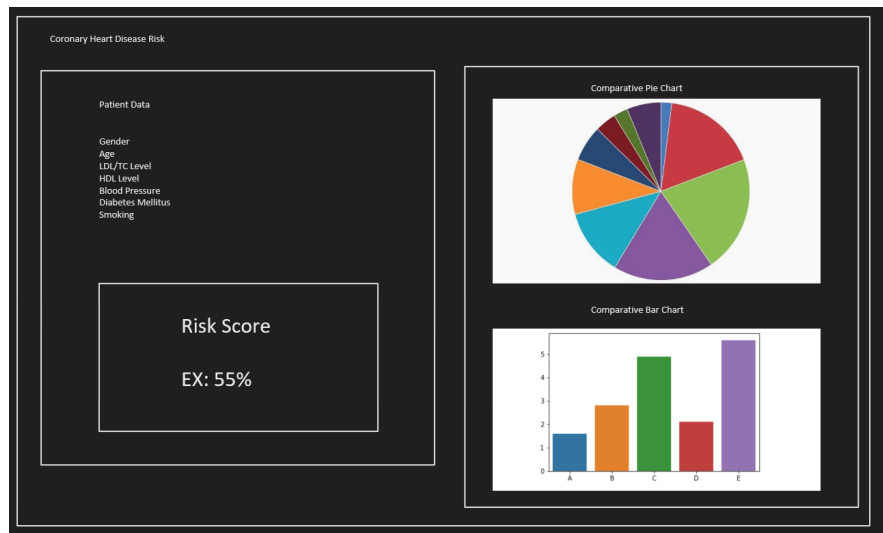


Figure 2—Screen Mock-up

1.6 References

- [1] Pekka, Jousilahti (Mar. 1999). *Sex, Age, Cardiovascular Risk Factors, and Coronary Heart Disease*. URL: [https://www.ahajournals.org/doi/full/10.1161/01.CIR.99.9.1165#:~:text=Among%20middle%2Daged%20people%](https://www.ahajournals.org/doi/full/10.1161/01.CIR.99.9.1165#:~:text=Among%20middle%2Daged%20people%20)

2C%20CHD , sex%20ratio%20varies%20between%20populations .&text=In%20both%20sexes%20%20the%20risk%20of%20CHD%20increases%20markedly%20with%20age.&text=Lipid%20abnormalities%2C%20high%20blood%20pressure,major%20risk%20factors%20for%20CHD..

- [2] Viera, Anthony (Aug. 2010). *Global Risk of Coronary Heart Disease: Assessment and Application*. URL: <https://www.aafp.org/afp/2010/0801/p265.html>.

2 IMPLEMENTATION PLAN

2.1 Project Tasks

2.1.1 Week 11

- Integrate Node.js as a sample app and deploy to SMART App Launcher
- Research other libraries for application

2.1.2 Week 12

- Work with SMART on FHIR api to retrieve patient data

2.1.3 Week 13

- Gather necessary patient data and build patient model

2.1.4 Week 14

- Build Framingham Risk Model
- Integrate framingham risk model with patient model

2.1.5 Week 15

- Build Demographic Risk Model
- Start Building front end visualization

2.1.6 Week 16

- Finish front end visualizations and graphs.

Week 11	Integrate Node.js as a sample app with SMART App Launcher	3/22 - 3/26
	Research other libraries for application	3/27 - 3/29
Week 12	Work with SMART on FHIR api to retrieve patient data	3/27 - 4/7
Week 13	Gather necessary patient data and build patient model	4/7 - 4/10
Week 14	Build Framingham Risk Model	4/10 - 4/13
	Integrate Framingham Risk model with patient model	4/13 - 4/14
	Build Demographic Risk Model	4/14 - 4/16
Week 15	Start Building Front End Visualization	4/17 - 4/23
Week 16	Misc. Reports and other non application deliverables	4/23 - 4/26

Figure 3—Timeline Table

2.2 Project Timeline

2.3 Needs/Risks

Highest risk will be integrating Node.js and other libraries with SMART on FHIR as well as acquiring the necessary patient data. These are the two topics that I am the least comfortable with and have allocated more time on the timeline towards these tasks. Another time sink will be creating the front-end visualizations and graphs.