

SeconDr.

Project Proposal



University
of Windsor



Object:

| Document Title |
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| Project Proposal |

Submitted To:

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| Project Customer |
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Chapter 1 : Project Introduction

1.1 Objective of Document :-

The purpose of this document is to facilitate the transfer of detailed information on the application named “SeconDr.”, which enlightens the unseen points of the healthcare system of Canada. The document also incorporates detailed project information with proper market research and total cost structure for the development of the project, with all the functional requirements and dependencies.

1.2 Project Background :-

In Canada, there has been a long-running debate about the long-term viability of the health-care system. Canada's healthcare system has gained positive support in the country, but at the same time has faced many health care challenges like,

Longer Waiting Time: According to data from the Commonwealth Fund International Health Policy Survey, Canada had the longest wait times for seeing a family doctor of the 11 developed countries^[1]. **Geographical Disparity:** People living in isolated areas, receive less adequate or appropriate health care, as they are now updated with the policies and are not able to contact anyone in a shorter time available. **Access to a Personal Doctor:** Easy and timely access to health care services is important for the health, and difficulty accessing these services could result in; increased risk of complications if a diagnosis is delayed, delays seeking and obtaining treatment and many more.

Health Policies and Ethics: Many Canadians do not know about the day-to-day updated health care policies and the plans which hospitals offer for the treatments. **Mental/Mood Disorders:** Many types of research have been conducted that has shown that over 2.9 million Canadians, aged 12 and over, suffered from mood disorders. And as we talk about International Students some of them have been found mentally depressed over time, for which the Canadian government has taken phenomenal steps, but eventually, they cannot reach every student for help.

1.3 Project Scope :-

As a team, we came up with an idea that offers the best solutions to the above-mentioned problems and many more features for the betterment of Public Healthcare. We are offering a mobile application called "SeconDr."

Every person seeking medical treatment always goes for a Second Opinion from a different doctor as mentioned above longer waiting time has gained a lot of attention, so by using our application we are connecting people with doctors whom they can have an opinion for their treatment by providing the necessary information. This project will provide a fast and straightforward approach for doctors consulting one-to-one with technical support for 24 hours a day. People in isolated areas can easily contact the desired doctor in no time by using our application.

Our special Artificial Intelligence will be there for suggesting the user to have an opinion from the doctor by recommending one from the previous experience of the user. Other than that users can always opt for any doctors available on the application for communication on the go. Mood disorders can be easily solved by playing a small refreshing game that is totally handled by AI and there will be emergency contacts always be available in case of a Mental depression problem or a chat bot with the user can talk anytime he/she wants. Artificial Intelligence will always keep you updated on all the latest health care policies which concern you the most and with your health.

Other than this the application offers Machine Learning to learn about the user and to improve the algorithms to give better suggestions to the user and to provide a good healthcare experience.

1.4 Project Obstacles :-

Data Scalability

The amount of data will be so huge, because of the patient personal data as it takes all the information of every patient registered in the application so database scalability is our biggest obstacle which we will cope with by using a real-time database (Firebase Firestore).

User Privacy

The data which will be stored by the application will contain a lot of private information about the user's health, which cannot be shared with an unauthenticated person. That is why the data will be kept encrypted by using Firebase Keystore.

Scope Creep

Scope creep is a common and major issue in this kind of big projects which includes this much amount of data processing. As our scope of project is defined properly by using SCRUM methodology, the problem of scope creep will be waived off.

Chapter 2 : Market Analysis

Current Opponents :-

Healthcare is a huge market where there are a plethora of projects available for the same purpose. Most of the known application works on a web-based platform, one of them is “cnacer.ca”, which gives the user just information on how to get a second opinion and what is the importance of the second opinion. It consists only of the information part, not the actual application. Whereas in “SeconDr.”, the main advantage is it offers not only the information but the actual option to get in touch with doctors to get a second opinion.

Other applications which are mobile-based application also provides the functionality of the second opinion but all of them focuses on some particular disease or illness. Most of them only offer to get a second opinion for highly affecting diseases, which is not the case for all the users. Another opponent will be Second Opinion Oncology^[2], which again is a very good application but only focuses on the oncology department’s patient. “SeconDr.” provides a good range of features, which not only includes getting a second opinion but many more features which can be helpful to the user at any point of time.

Market Risk

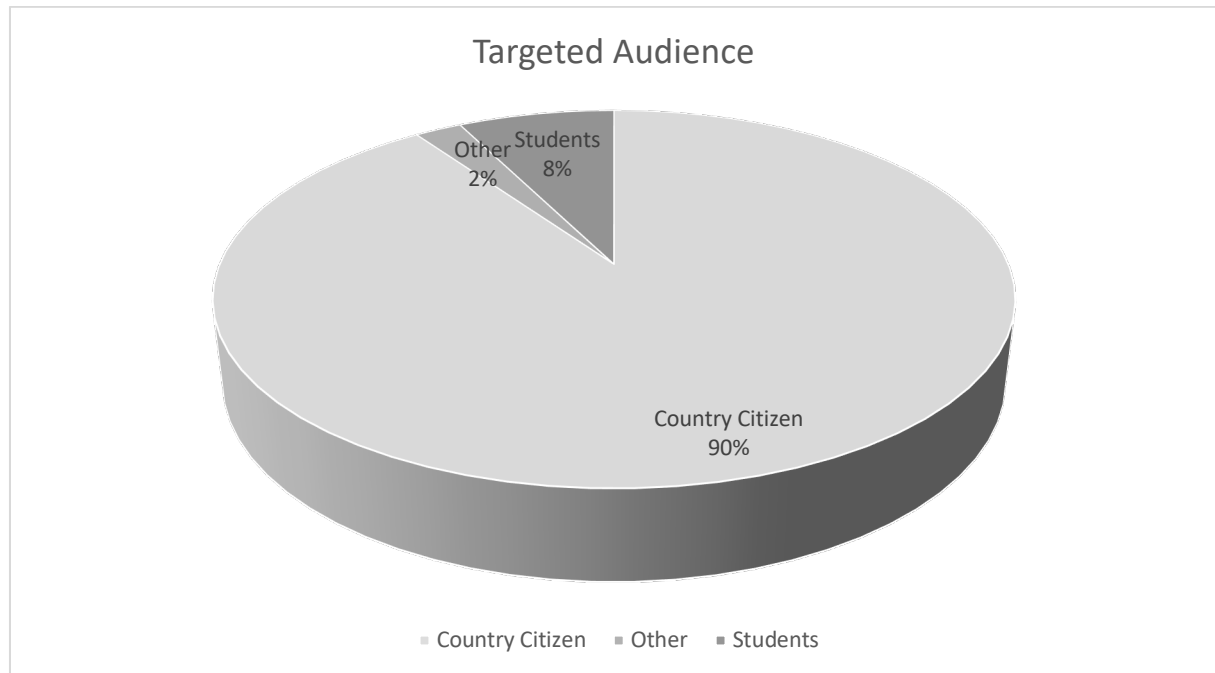
There are many other small websites available that also provide the same functions, but in the end, websites are not that handy because a mobile application is more comfortable than a website. And our application has an AI chatbot feature that also works in an offline mode so in emergency cases it will be the most useful feature.

User Expectations :-

User satisfaction is our motto, great user experience will create a good market value for the project. Therefore, by providing a greater User Graphical Interface will create a good impact on our users, as all user always finds application to be as simple as possible, which provides good features in a minimalistic way.

Targeted Audience :-

Our main targeted users are people who live in isolated places who are looking to get a second opinion on any kind of disease and from any kind of doctor who is registered. As a target user, we include citizens of the country, students from abroad and a small part of visitors from worldwide.



SeconDr. will be helpful to all the citizens, which have AI feature included at mostly all features, that will attract more and more user. Without any partiality issues of age, gender, education, occupation, or religion, anyone can use our app.

Chapter 3 : Project Features & Elements

3.1 Application Features :-

| Application Feature | Description |
|-------------------------------------|--|
| User Registration / Login | User can create or sign in to their account by using their credentials. |
| User(Patient) Data Updation | User's(Patient's) data is saved in the firestore for fast access as per user updation. |
| Getting 2 nd Opinion | User can ask for any available doctor who has been asked by him/her or suggested by the system. |
| Locate Labs & Health Centers | All the available health centers will be showed on the home screen for easy and fast reach. |
| Artificial Intelligence Suggestions | Auto AI will suggest patient to reach out particular doctor or hospital as per users usage and feedbacks analysis. |
| AI Chat Bot | This feature will help any person who is finding someone to talk with and AI will response as per his/her application usage and data analysis. |
| Health Policies Update | User will get a notification every time the policies get updated or any hospital changes the guidelines. |

3.2 Functional Objectives :-

High Priority Features

All the features which fall under this category will be directly related to the second opinion portion. Like, chatting and AI suggestions would be the top priority.

Medium Priority Features

All the features which fall under this category are related to mental and mood health. Because it is the second most point on which we are going to work which, includes the AI Bot also.

Low Priority Features

Doctor's adding to the application will be the last step as first we need to make a good and secure application on which our users can trust.

3.3 Non - Functional Objectives :-

Security

- All the measures will be made to maintain the privacy of the target audience.
- Authentication will be achieved at the login or register phase.
- Databases will be protected from the different cyber-attacks.

Accessibility

- Easy to understand User Interface.
- Proper visual representation of the information to all users.

Robustness

- Application will be able to stand against the different types of the errors.
- Machine learning model can handle erroneous inputs.

3.4 Project Technical Requirements:-

- Android Development Tools (ADT) – For application development
- Android 8.0+, API Level 26+ - For application usage
- XML – Front-end Technology
- Firebase Firestore – Database
- Tensorflow – For Artificial Intelligence and Dataset storage
- JIRA, GitHub – Project Management Tools

Chapter 4 : Cost Analysis

Professionals from different sectors are required in our project. Based on the requirements, the professionals along with their salaries are as follows:

1) Full Stack Developer :

We will require 4 full-stack developers in the project for application development. The approximate salary of a full stack developer is 85,000 CAD/Year. In general, a developer works for 40 hours per week so that results in 40.86 CAD per hour.

Total 4 developers will work for 18 hours a week for 10 weeks on our project/application. So, the total cost of 4 full-stack developers for the defined duration will be **29,419 CAD**.

2) AI Engineer :

We require 2 Artificial Intelligence Engineers for the project. The approximate salary of an artificial engineer is 12,00,00 CAD/ Year. In general, an engineer works for 40 hours per week, which results in 57.69 CAD per hour.

Total 2 engineers will work for 20 hours a week for 8 weeks. So, the cost of 2 AI engineers for the duration of the project will be **18,460 CAD**.

3) Scrum Master :

The approximate salary of a Scrum Master is 80000 CAD/ Year. In general, an engineer works for 40 hours a week, which results in 38.46 CAD per hour. Scrum Master will work for 15 hours a week for 10 weeks. So, the cost of a Scrum Master will be **5,769 CAD**.

4) Quality Assurance Engineer :

We require just one Quality Assurance Engineer for the project. The approximate salary of a Quality Assurance Engineer is 71,000 CAD/ Year. In general, an engineer works for 40 hours per week, which results in 34.13 CAD per hour. Just 1 engineer will work for 10 hours a week for 2 weeks. So, the cost for the Quality Assurance Engineer will be **682 CAD**.

Various chargeable software's and tools are required for development of the project. They are as follows:

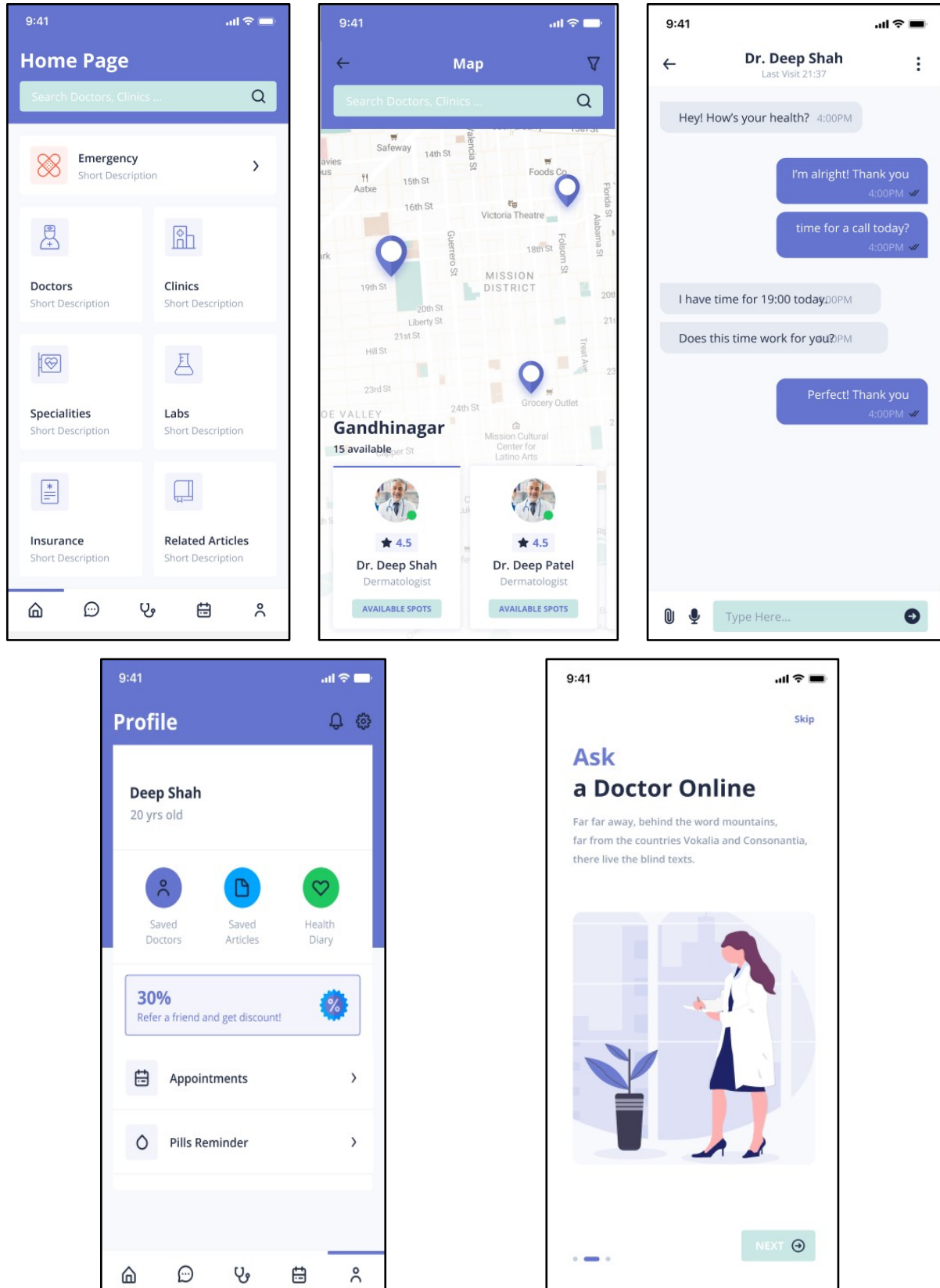
- 1) JIRA license
- 2) Firebase Firestore
- 3) Symptoms Dataset
- 4) Internet/Electricity

Approximate cost of all the software's and tools is **2,000 CAD**.

Incidental cost for the whole project development will be **7,000 CAD**.

So, the total Cost of the Project will be 63,330 CAD

Chapter 5 : Prototype / Mock-Up



Chapter 6 : Quality Assurance Plan

As described in the scope creep, for this amount of data manipulation in the project we are going to use SCRUM as our Methodology for building our project. The use of SCRUM will help all the team members and clients to coordinate properly for a successful build of a project. We will follow SCRUM for the whole project development.

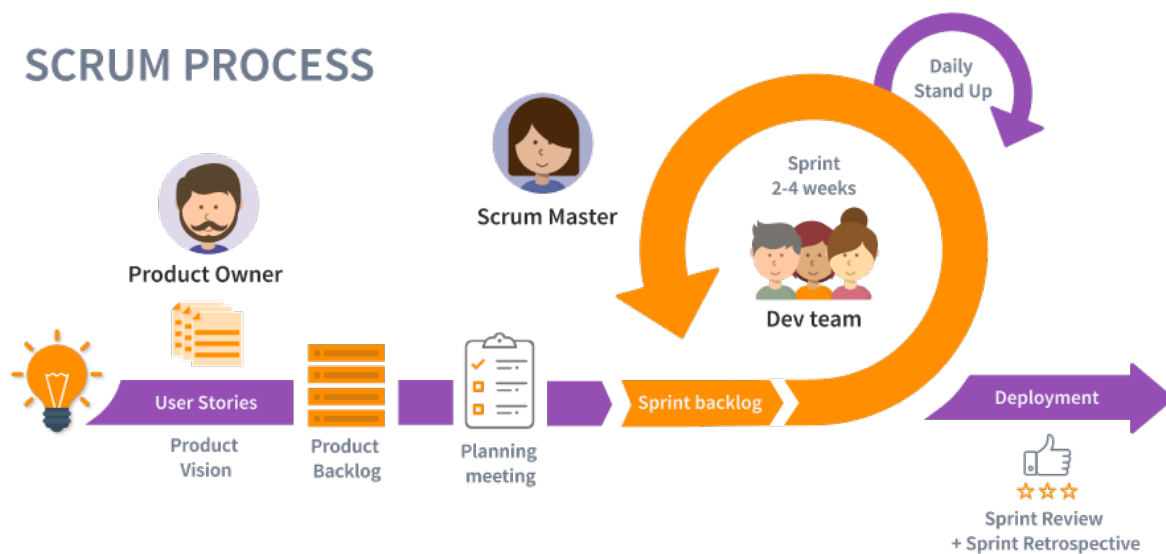


Image 1.1 Scrum Lifecycle^[3]

Daily Stand Up Meeting :-

Daily SCRUM stand-up meets will happen at 9:30 PM for 40 minutes and every time this much information will be shared to every team members.

- Tasks completed every day.
- Tasks to be completed on day after.
- Any uncertain task or problem solution discussion.

Every tasks done will be uploaded to JIRA daily so, all the team members can review or use it as per their requirements.

Project Review & Audit :-

Review of every submission to JIRA would only be added to the project only after successful testing of that particular block it will be merged to the project. Every block of the update should follow all the rules defined and the standards of coding with proper formatting and if the update is required then proper commenting will be done.

Daily scrum in audit interaction will increase engagement, enthusiasm and transparency.

Project Testing :-

Testing is the most important part of the project development life cycle. Testing must be done because bugs are like a virus that will cost you so much in future if not taken care of. We use the black-box and unit testing for every code being built to ensure a full quality product.

Any time where a QA professional doesn't look into the code before testing can be considered black box. With black-box testing, the QA can test the software in the same way a customer would experience it^[4].

Project Control :-

Every communication in the project will be done by Microsoft Teams and Outlook. Communication with customers and experts will be done by scheduling a meeting on any available/preferable platform like; Zoom or Microsoft Teams.

Project Coding Conventions :-

Throughout the whole life cycle developers will follow the coding standards as shown below:

JAVA : <https://www.oracle.com/java/technologies/javase/codeconventions-contents.html>

XML : <https://www.w3schools.com/xml/default.asp>

Python : <https://www.python.org/dev/peps/pep-0008/>

JavaScript : <https://make.wordpress.org/core/handbook/best-practices/coding-standards/javascript/>

Firebase : https://firebaseopensource.com/projects/firebase/firebase-ios-sdk/code_of_conduct/#our_standards

Project Development Roles :-

| Name | Development Roles |
|---------------------------|---|
| Bhavya Chirag Bhimani | Artificial Intelligence Engineer |
| Deep Nitesh Shah | Full Stack Developer & Scrum Master |
| Het Shaileshbhai Patel | Full Stack Developer |
| Hiten Harshadbhai Patel | Artificial Intelligence Engineer & Quality Assurance Tester |
| Rahil Utpalkumar Shah | Full Stack Developer |
| Rutvik Nareshbhai Lathiya | Full Stack Developer |

*These are tentative roles, they may change as per the requirements.

Chapter 7 : Project Planning

We are following the SCRUM methodology for the development of the project. So, the team will follow the five sprint plan of 14 days each. The sprints are as follow.

Sprint 1:-

Start Date : 13th September 2021

End Date : 24th September 2021

During the Sprint:

- Basic User UI Setup
- Firebase Project Creation
- Firebase Connectivity to Java(Android/IOS)

Milestone 1 : Till this milestone all the basic functionality will be done.

Sprint 2:-

Start Date : 25th September 2021

End Date : 6th October 2021

During the Sprint:

- Dataset connection & Superset creation
- Tensorflow dataset creation and connectivity
- User Interface Build Up

Milestone 2 : Till this milestone all the AI and ML related work will be started and all the algorithms will be started building.

*6th – 17th October is reading week.

Sprint 3:-

Start Date : 18th October 2021

End Date : 29th October 2021

During the Sprint:

- Connectivity between the dataset and application
- Artificial Intelligence Chat Bot build up
- First Quality Assurance Testing

Milestone 3 : Till this milestone all the superset/dataset will be connected to the main application which will be built in TensorFlow.

Sprint 4:-

Start Date : 30th October 2021

End Date : 10th November 2021

During the Sprint:

- Proper user authentication
- Testing of user data for AI Suggestions
- Black-box testing
- Bug Fixing

Milestone 4 : Till this milestone AI will be tested and will be running properly with user's input and will give feedback for hospital or doctors references.

Sprint 5:-

Start Date : 10th November 2021

End Date : 22nd November 2021

During the Sprint:

- Finalizing the application
- Prepare test-cases
- 2nd and Final Quality Assurance Test

Milestone 4 : At this milestone project will be ready for running and will be presented as a final product to the client.

Chapter 8 : References

- [1]. <https://idealmedhealth.com/health-care-issues-in-canada/>
- [2]. Second opinion Oncology by VisionMED Oncology
<https://apps.apple.com/ca/app/second-opinion-oncology/id1571916464>
- [3]. Image Resource
<https://www.tuleap.org/agile/agile-scrum-in-10-minutes/>
- [4]. <https://www.applause.com/blog/functional-testing-types-examples>