NOVA
Health Care Application and Digital Assistant

Software Requirements Specification

Version 1.0

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1. Introduction

1.1 Purpose

The purpose of the Software Requirements Specification is to describe the specific requirements of the Health Care Project. Included with the description of the requirements is a description of any constraints or assumptions that the project is working within.

This document also provides a description of any project dependencies that need to be explicitly expressed. It describes the overall constraints that the project is working on as well as the assumptions made while building the project and analyzing its requirements. Along with the requirements descriptions, it is also the purpose of this document to describe any performance requirements that need to be met. If there are any standards that need to be considered when developing the software are also listed.

Lastly, the purpose of this document is to communicate the system attributes of the Healthcare application. Design constraints and standard compliance are also considered in this section. It deals with the performance requirements that are These system attributes include reliability, availability, scalability, maintainability, and portability.

1.2 Scope

The scope of the Software Requirements Specification is to describle in details the requirements for the Health Care Application. This majorly will include permonace requirements, system constraints and assumptions that have been made while formulating the requirements.

It is outside the scope of this document to deal with the hospital management system, possibility and algorithms used for prediction of diseases. It is also outside the scope of the document to describe in any possible detail of how the certain mentioned or technologies work and operate.

1.3 Definitions, Acronyms, and Abbreviations

Table 1: Definition, Acronym, Abbreviation

Definition, Acronym, or Abbreviation	Description
API	Application Program Interface

1.3 References

Table 1: Definition, Acronym, Abbreviation

References	Link
App development	https://www.scnsoft.com/healthcare/mobile
Data Flow Diagram	https://www.lucidchart.com/blog/data-flow-diagram-tutorial

2. Overall Description

2.1 Product Perspective

The Health Care application that is to be designed aims at assisting users to initially deal with their health problems and then contact nearby hospitals and make appointments for the same. We are aiming to incorporate a chatbot to put panicking users at ease. The Healthcare Application and its requirements are only pertaining to the functionality needed to implement the Healthcare Application.

This software is being developed in increments, and is not being programmed to detect diseases from symptoms. An API can be integrated at a later incremental stage judging by the financial budget and time availability.

The software will be requiring permissions and access to the user’s device location to track the current GPS and locate nearby hospitals. For the same purpose, hospitals have to be contacted and they need to give accent to participate in this application’s search program.

2.2 Product functions

The following is a table of the requirements that the system SHALL meet. The list of the requirements was produced from the initial project documentation provided by the requirements experts.

TABLE 2: Table of SHALL Requirements

ID	Origin	Shall Requirement
1	Project Description Document	The client shall be able to maintain his/her own account in the application
2	Project Description Document	The client shall be able to maintain his/her medical database, for reference and application function assistance.
3	Project Description Document	The client shall be providing its device location to the application to help it track and locate nearby hospitals
4	Project Description Document	The client shall be able to update and record his/her health information like Blood Pressure and PR.
5	Project Description Document	The client shall be able to feed in the sympotoms for further medical analysis and diagnosis of ailment
6	Project Description Document	The client shall be able to speak with a chatbot
7	Project Description Document	The client shall be allowed to locate the details of the hospitals in a 1km radius
8	Project Description Document	The client shall be able to make appointments with the said hospitals in a case of an emergency
9	Project Description Document	The hospital management staff will be able to authorize the appointments.

2.3 Constraints

The follow is a table of the design constraints that the system SHALL encounter. The list of constraints was produced from the initial project documentation provided by the requirements expert.

Table 3: Table of Design Constraints

1	Project Description Document	The client will not be able to dynamically able to synchronize his medical data with the device.
2	Project Description Document	Immediate fluctuations in medical in health patterns SHALL not be mapped, but client will be given an option to edit and make changes.
3	Project Description Document	Significant cost SHALL be incurred in order to integrate an API for prediction of diseases from symptoms
4	Project Description Document	The further versions of the system SHALL be backward compatible with the original version.
5	Project Description Document	The cost of domain purchase for the database SHALL be significant enough and domain should be capable enough to handle

2.4 User Characteristics

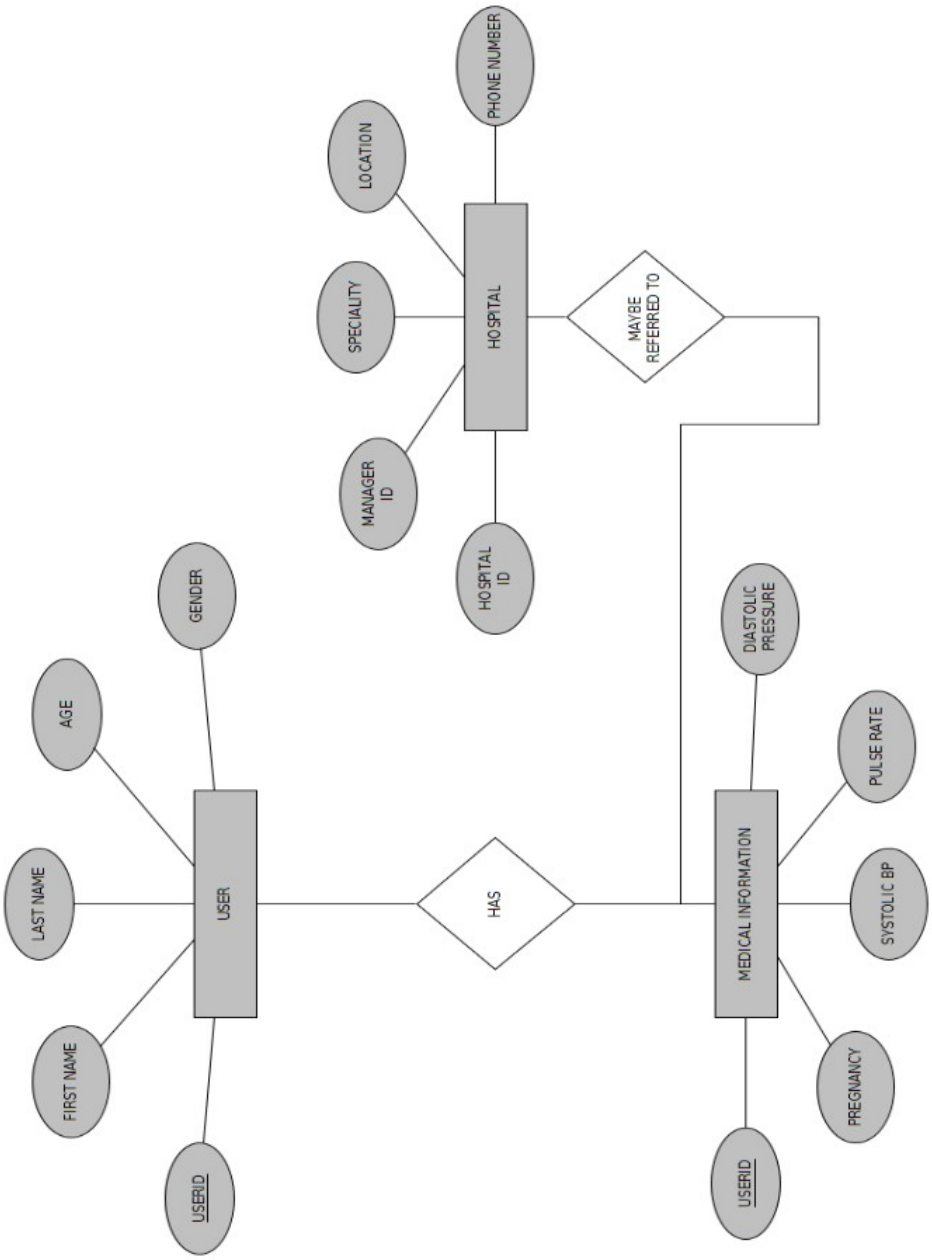
The HealthCare Application is using an external API, and Watson chatbot, and a rudimentary databaseto implement the required functionality, which has placed certain design constraints on the design of the application. The table below lists those design constraints.

Table 4: Table of User Characteristics

USER	DESCRIPTION
Client	The client is anyone who uses the app for personal purpose, and with a motive to lead a healthy lifestyle. The clients can be users from all backgrounds. Because of this, the system should be easy to use and user-friendly and should conform to commonly understood user interface styles for wide acceptance
Hospital Manager	The hospital manager is a person from each hospital who moderates the incoming appointments made from the app and simultaneously accepts or declines them. This group is only consisted of professional people or people who have expertise in the medical field
Moderator	The moderator is a person who check all incoming requests and outgoing requests to and from hospitas and manage records. He is also a professional and should be literate and technically competent in performing administraton on computer systems

2.5 E-R Diagrams

Figure 1: ER Diagram



2.6 Data Flow Diagram

The following figures represent the data flow diagrams of the Health Care Application The first data flow diagram, is the top level data flow.

Figure 2 : Level 2 Data Flow Diagram

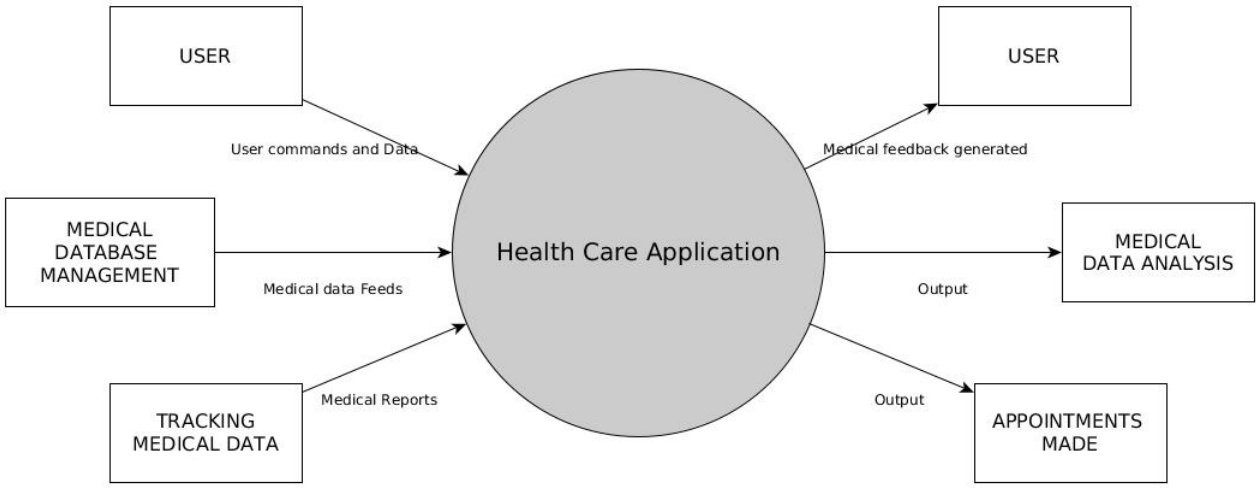
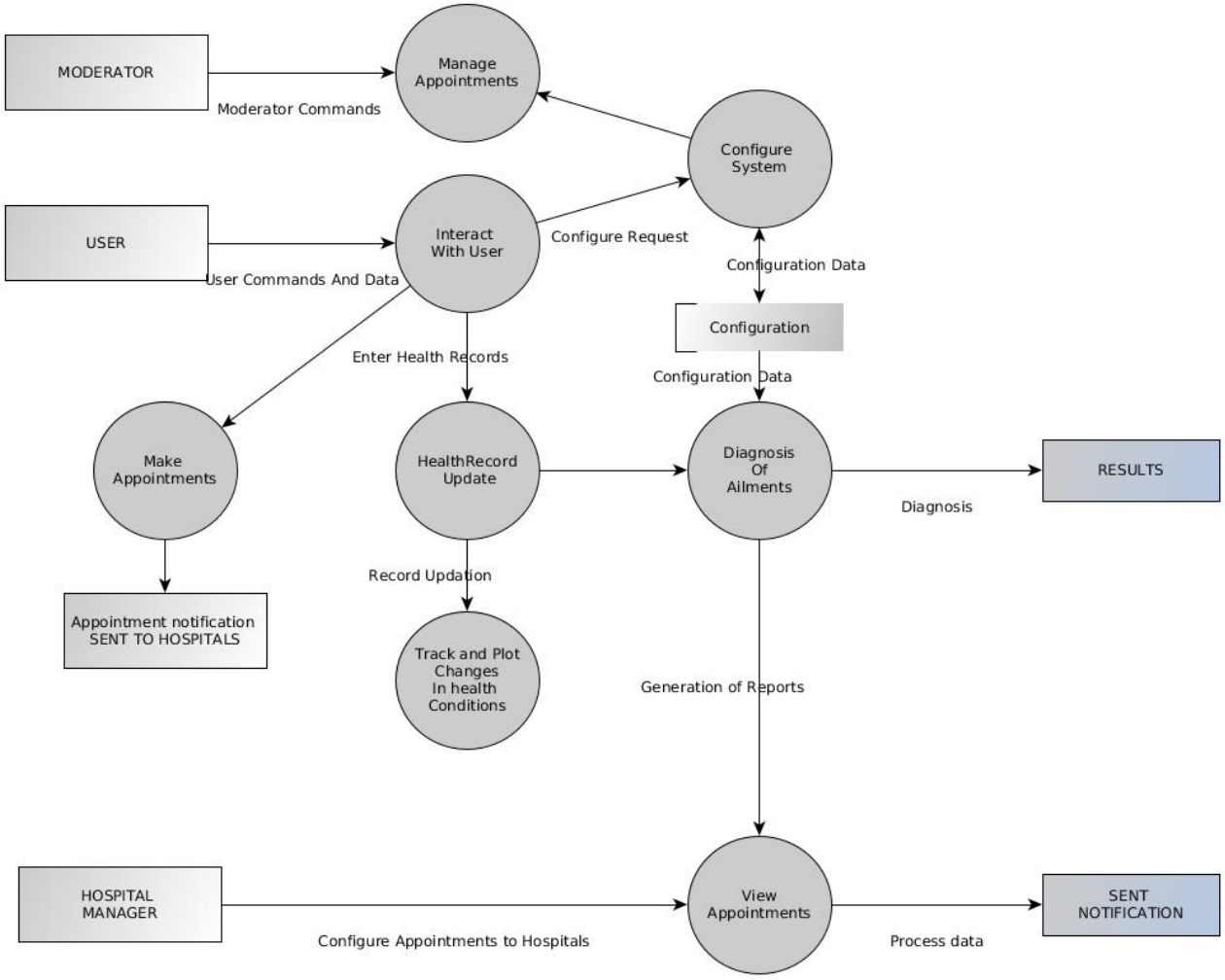


Figure 3: Level 1 Data Flow Diagram



2.7. Data Dictionary

The follow tables in this section make up the data dictionary for the Healthcare Application. Using the Data Flow Diagrams, the following Data Dictionary elements were defined.

- User Stamp
- User Medical Record
- User Symptom Entry
- Location
- Hospital ID
- Appointment Request
- User Commands and Data

Table of Data Dictionary

Data Dictionary Attribute	**Detail**
Name	User Stamp
Aliases	Login info/ User info
Where Used / How Used	Used for user authentication during signup and login processes
Description	Stamp= Identification of sender + User name of the sender+ email-ID + password Identification of sender = *any string that is the unique name of the sender* User = *any string of ASCII characters* Email-ID = *Domain name of the email server* Password = *any string of letter/ numbers/ special characters*

Data Dictionary Attribute	**Detail**
Name	User Medical Record
Aliases	Medical Record
Where Used / How Used	Used to store individual's users medical records and to keep track of changing health patterns
Description	User Medical Record: User-ID+Age+Gender+Systolic BP+Diastolic BP+PR+pregnanacy User-Id:*String of characters representing the user's name, or any other unique identity* Age =* any integer n, such that 5<n<120 * Gender = ***Single Character M/F*** Systolic BP= *Unsigned 8 bit long integer * Diastolic BP=* Unsigned 8 bit long integer * PR=* Pulse Rate as an 8 bit insigned value * Preganacy= *Boolean Value *
Supplementary Information	User Medical Records will be encrypted using a hashing so that it isnt leaked anywhere. Personal information should be prevented from leakage.

Data Dictionary Attribute	**Detail**
Name	User Symptom Entry
Aliases	None
Where Used / How Used	Sysmptoms extracted from the text and sent to an API for diagnosis of probable elements
Description	User Symptom Entry: **string of comma separated values**
Supplementary Information	None

Data Dictionary Attribute	**Detail**
Name	Location
Aliases	GPS, Address
Where Used / How Used	To fetch the address of the user's device using the Google Geolocation API
Description	E email attachments Email message = *any string of ASCII characters* Email attachments =*one or more files of any type*
Supplementary Information	None

Data Dictionary Attribute	**Detail**
Name	Hospital ID
Aliases	Hospital Key
Where Used / How Used	To identify uniquely each hospital present in the database
Description	Hospital ID = *String of 5 alphanumeric characters to uniquely represent each hospital present in the database*
Supplementary Information	Hospital ID is generated automatically by a combination of Strings from the hospital name after the hospital is registered with the company.

Data Dictionary Attribute	**Detail**
Name	Appointment Request
Aliases	NO
Where Used / How Used	Request made to a hospital by the user
Description	Appointment Request: User-ID + User IP + identification of hospital + Hospital IP User-Id = *any string that is the unique name of the sender* Hospital ID= *String of 5 alphanumeric characters to uniquely represent each hospital present in the database * User IP =[user + '@'+ server | anonymous] Hospital IP =[user + '@'+ server | anonymous]
Supplementary Information	None

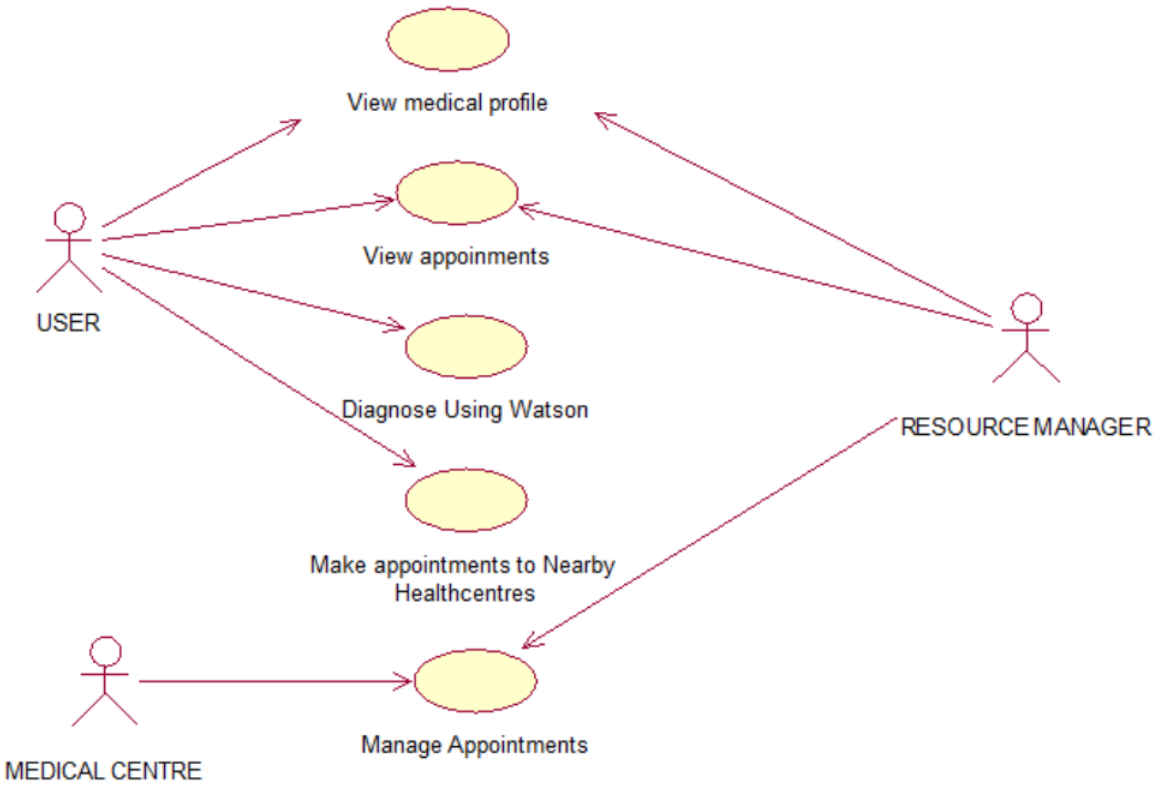
Data Dictionary Attribute	**Detail**
Name	User Commands and Data
Aliases	NO
Where Used / How Used	Interactive with user (input)
Description	User Commands and Data = commands + data Data = * any email message and attachment data * + configuration data
Supplementary Information	Commands originate from the user by clicking specific button or menu items. Commands will be converted into events in the operations system automatically and then the email client software captures those events and responds them accordingl

2.8 Assumptions

The following table lists the assumptions made by the requirements that have been made in the Healthcare Application Software

Assumption	Description
Secure Channel from User to Hospitals	The defined requirements assume that there is a method for secure transfer of information between the client and the hospitals
Secure Encryption of Personal Data	Personal data that is fed into the database is encrypted with a secure algorithms to prevent unauthorized access to data

Use Case Diagram:



3. Specific Requirements

3.1 System Features

3.2.1 Maintaining Record Of User-Health information

Introduction

The application will provide users with an interface to update their health related information such as blood pressure, pregnancy and other information, and constantly keep track of the changes that happen with a progress graph

Functional Requirements

Purpose: Maintaining a record of health information for users and continuously track changes

Input: Constants fed by the user, based on his health information.

Processing: The data entered by the user will be stored in the database, and also processed to notify irregularities in the changes

Output: An output/ prediction that shows the changes trends of the user's health conditions in the form of textual output or graph plots.

Stimulus Response

A) User Maintains and views his/her recorded health information

User Actions	**System Actions**
(1) Fill in data as per as the form provided	
(2) Press Submit	
	(3)Detect anomalies in the data entered
	(4)Ask user for confirmation of data
(5) Confirm/Decline and re-edit	
	(6) On confirmation ask user whether he wants to view a feedback report as per as his entered fields
(7) Confirm	
	(8) Display a feedback report

3.2.2 Disease Diagnosis

Introduction

The software helps diagnosis ordinary ailments from symptoms with the help of an external API.

Functional Requirements

Purpose: Diagnosis of ailments with the help of an external API

Input: Comma separated symptoms in the form of textual entry

Processing: The feed thus generated is sent to an external API for processing.

Output: The output obtained from the API is displayed

Stimulus Response

User Actions	System Actions
(1) Enter comma separated symptoms of the ailment	
(2) Press on Submit button	
	(3) Verify format of data
	(4)Send raw data to external API
	(5) Retrieve feedback/ output from the API
	(6) Display the output on the frontend GUI

3.2.3 Contact and Make Appointments with Nearby Hospitals

Introduction

This feature will capture the user's device location and locate hospitals around a said kilometre radius. After location of the hospitals, the user is free to make appointments in any one of these

hospitals. The user can avail the contact details and directly contact the aforementioned health centres or, he/she can also

Functional Requirements

Purpose: To facilitate users to make appointments to nearby hospitals in case of emergency conditions.

Input: User click on locate hospitals, to generate list of nearby hospitals, then choose a hospital where the appointment should be made.

Processing: The Google Geolocation API is used to track the user's location and also facilitate making appointments to the hospitals.

Output: A list of nearby hospitals is provided along with their contact details.

User Actions	**System Actions**
(1) Give permission to the app to track your location.	
	(2) Location of user device tracked usong the Google Geolocation API
	(3) System checks for all health centres present in a 1 km radium around the user's location
	(4) Display list of all the available health centres along with their contact details, fetched from the database
(5) Choose which health centre to make an appointment at	
(6) Confirm Health Centre	
	(7) System contacts corresponding health centre

4. Software System Attributes

Reliability

Reliability in the HealthCare software will be ensured by thorough unit, milestone, and release testing. Comprehensive test scenarios and acceptance criteria will be established to reflect the necessary level reliability required of the HealthCare Application . The all delivered source code will be thoroughly tested using the established test scenarios until the acceptance criteria are satisfied by the HealthCare Application .

Security

The HealthCare Application software will utilize Pa secure key encryption strategy. Every medical record entered shall be securely encrypted.

Maintainability

Along with the well-formed programming enforced by Python, best practice development conventions will be enforced for the construction of the HealthCare Application . These will include adequate commenting within the source code that complies with and uses the automated Python documentation standard so that source code documentation will be able to be automatically generated. Consistent variable naming conventions will be used by all the programmers. Consistent spacing will be used in the source code by all the programmers. The design of the source code will use the principles of Object-Oriented Design and the source code will be programmed using Object-Oriented Programming. Object-Oriented Design and Object-Oriented programming will make the code easier to understand.

Portability

As mentioned above, the HealthCare Application will be written in Python and gain the portability providing by that language.

It is safe to say that the implementation of the HealthCare Application will be able to be ported to other system platforms that accept Pythonapplications with little to no changes required. It is not safe to say that the HealthCare Application will execute properly on the other system platforms with little or no change. Significant changes to the HealthCare Application may be required to ensure proper execution on other system platforms.