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# COVID-MATE

## Software Requirements Specification

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# Contents

# Section 1 – Introduction

## 1.1. Purpose

The COVID-19 pandemic has brought in many challenges for the world . As we all know, the breakout of the novel coronavirus has left no area untouched. Our Software is aimed at the common masses who want to watch out for their symptoms and prevent harm early.

- This software will check the temperature of individuals using temperature sensors/infrared cameras to keep check on fever and related issues.
- This new software will be connected to google maps for showing the highly crowded areas so that the individual can maintain social distancing.
- It will collect data such as the age and current medical conditions of the person (if any) and keep a check on heart rates (provided the phone has appropriate sensors).
- Furthermore, it will assist the individual to reach the nearest testing center using GPS.

## 1.2. Document Conventions

| Acronyms | Description |
|---|---|
| 1. Flutter | Flutter Software Development Kit |
| 2. App | Application |
| 3. API | Application Programming Interface |
| 4. Bug | Errors in the application |
| 5. Ads | Advertisements |
| 6. OS | Operating System |
| 7. GPS | Global Positioning System |
| 8. SDK | Software Development Kit |
| 9. SQL | Structured Query Language |
| 10. Temp. | Temperature |

## 1.3. Intended Audience and Reading Suggestions

Each project is successful when it achieves the goals of the stakeholders. Projects are the teamwork in which many people play various roles at different stages and in different ways. They can be project managers, developers, end-users, testers, and so on. Brief description of the intended audience for this document is given below:

Project managers: Scrum masters or team leads are the project managers who play the main role in planning the software. They are the one who motivates, organizes, and coordinates the developers.

Customers: Customers specify the requirement for the software to be engineered and other stakeholders who have a peripheral interest in the outcome.

Developers: Developers are the people who deliver the technical skills. A software developer is involved in all the processes related to creating and designing; from initial planning to establishing parameters, designing, writing, coding, encrypting, and testing.

End-users: The end-user is the person who uses the software after it has been fully developed, marketed, and installed. They are the people who actually test the software after completion and call the "IT" with questions about why the product is not working correctly.

## 1.4. Project Scope

We are going through unprecedented times no one has ever gone through. During this time, we feel it is essential to have a mate who can keep an eye on you, care for you and make you feel rest assured. For this very purpose, we are developing COVID-Mate, a companion who can monitor you whenever needed. To accomplish this, the app will monitor temperature, heart rate and others (provided the required sensors are present in the phone). As an addition, the app can make use of infrared cameras to measure and display temperature accurately. Nextly, the app will also be able to redirect you to the nearest COVID-19 testing center in case things have not been going so well. Furthermore, the app will link to google maps to tell you when to ideally shop for those little groceries you have been planning to purchase for a while. In a nutshell, our app will be your trusted mate during these uncertain times.

### Goals

The goals that this system plans to achieve are:

1. Increased sales of infrared cameras that can be attached to mobile phones
2. Accurate crowd density data as user base expands leading to partnerships with grocery stores
3. Preferential advertising of stores leading to increased revenue.

## 1.5. References

1. https://nordicapis.com/what-is-the-difference-between-an-api-and-an-sdk/
2. https://medium.com/flutter-community/pros-and-cons-of-using-flutter-1f5d1269a4b9
3. https://www.cnet.com/health/how-to-track-your-heart-rate-with-a-smartphone/
4. https://www.simform.com/mobile-app-developers-database-selection/
5. https://www.informit.com/articles/article.aspx?p=336262
6. https://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database
7. https://www.c-sharpcorner.com/article/software-requirements-specification/
8. https://pdf4pro.com/view/dr-pat-mirenda-software-design-specification-12475d.html
9. https://owasp.org/www-project-mobile-security-testing-guide/
10. https://arxiv.org/pdf/1005.0330.pdf
11. https://developers.google.com/maps/documentation
12. https://flutter.dev/docs/get-started/install
13. https://pmstudycircle.com/2012/06/stakeholder-register-project-management/
14. https://en.wikipedia.org/wiki/Mobile_operating_system

# Section 2 – Overall Description

## 2.1. Product Perspective

Our product is intended to be free for users with the option for a premium version whose works are underway. The application will be implemented in the likes of the client-server model. Our software will be a one-stop app in these uncertain times of COVID-19 wherein a person can monitor themselves and make decisions on trivial yet significant matters including shopping based on information available (busy times etc.).

Some of the main functionalities of our app include:

1. Cross-platform support: As our app development takes place using Flutter, our product will be available to both android and iOS users.
2. Profiles: The app will have individual profiles for each user of the app on the same device, hence the potential of the app will be fully utilized.
3. Self-check section: This section will allow users to check their physical conditions including temperature (infrared cameras recommended, if available), heart rate (using the technique of *photoplethysmography* with the aid of smartphone flashlights).
4. Crowd notifier: Using the support of google maps APIs, the app will be able to notify users of highly crowded areas and redirect to a less crowded alternative when necessary.
5. Support section: The app will have a built-in support section for users to report issues and resolve them.

## 2.2. Product Features

Our software will provide the features as listed below:

1. Collect user information enabling creation of various profiles on the same device (age, medical conditions, profile).
2. Monitoring temperature and heart rates (using infrared cameras/sensors).
3. Tracking crowded areas using Google Maps' APIs
4. Redirecting to the nearest COVID-19 test center with the aid of GPS.

## 2.3. User Classes and Characteristics

Potential users of our system should be able to login and check their vital signs (temperature, heart rate etc.) while also accessing other information including crowd density at a given place at a given time and alternatives available, if necessary. Adding to these, the user must also be advised if he should be getting tested and directed to the nearest COVID-19 testing center as and when needed. Based on the above information and goals, the system will provide four types of user classes:

1. Basic user – will be able to
    1.1. Monitor temperature and other vital signs
    1.2. Create up to 4 profiles for different users
    1.3. Track crowded areas and get notified
    1.4. Get redirected to the nearest testing center, if necessary
    1.5. Access support if necessary
2. Premium user – will be able to
    2.1. Monitor temperature of multiple users at the same time using infrared cameras
    2.2. Create unlimited profiles
    2.3. Track crowded areas and get notified when crowd reduces
    2.4. Get redirected to the nearest testing center, if necessary
    2.5. Take advantage of 'no ads', higher request priorities
    2.6. Access support if necessary
3. Support staff – will be able to
    3.1. Get notified when support is requested
    3.2. Prioritize requests
    3.3. Chat with the user facing issues
    3.4. Get feedback from user
4. Administrator – will be able to
    4.1. Reset user settings when requested
    4.2. Add/remove testing center data
    4.3. View/modify/delete data
    4.4. Release bug fixes and software updates

## 2.4. Operating Environment

The operating environment plays a great role. It is an indispensable part of any software project. Some of the environments on which our software will work are given as follows:

1. The software will run on both the android and iOS OSs
2. The software will be developed using the programming language 'Dart' (SDK Flutter)
3. The database used for the software will be MySQL

## 2.5. Assumptions and Dependencies

The app is planned to work on iOS and android, but in case of certification/licensing issues, the SRS should be updated accordingly. Also, complete functionality of the app is assumed to be possible only when the required sensors (camera, flashlight etc. ) function properly.

Some of the API's and/or SDKs planned to use for our app are:

1. Google Maps APIs: The crowd notification feature and redirection feature are dependent on obtaining these APIs.
2. Flutter SDK: Is used to develop the application to function well in both iOS and android OSs.

# Section 3 – External Interface Requirements

## 3.1. User Interfaces

Our system is intended to be used for mobile and will be a mobile application. Following are the UI elements the app must have:

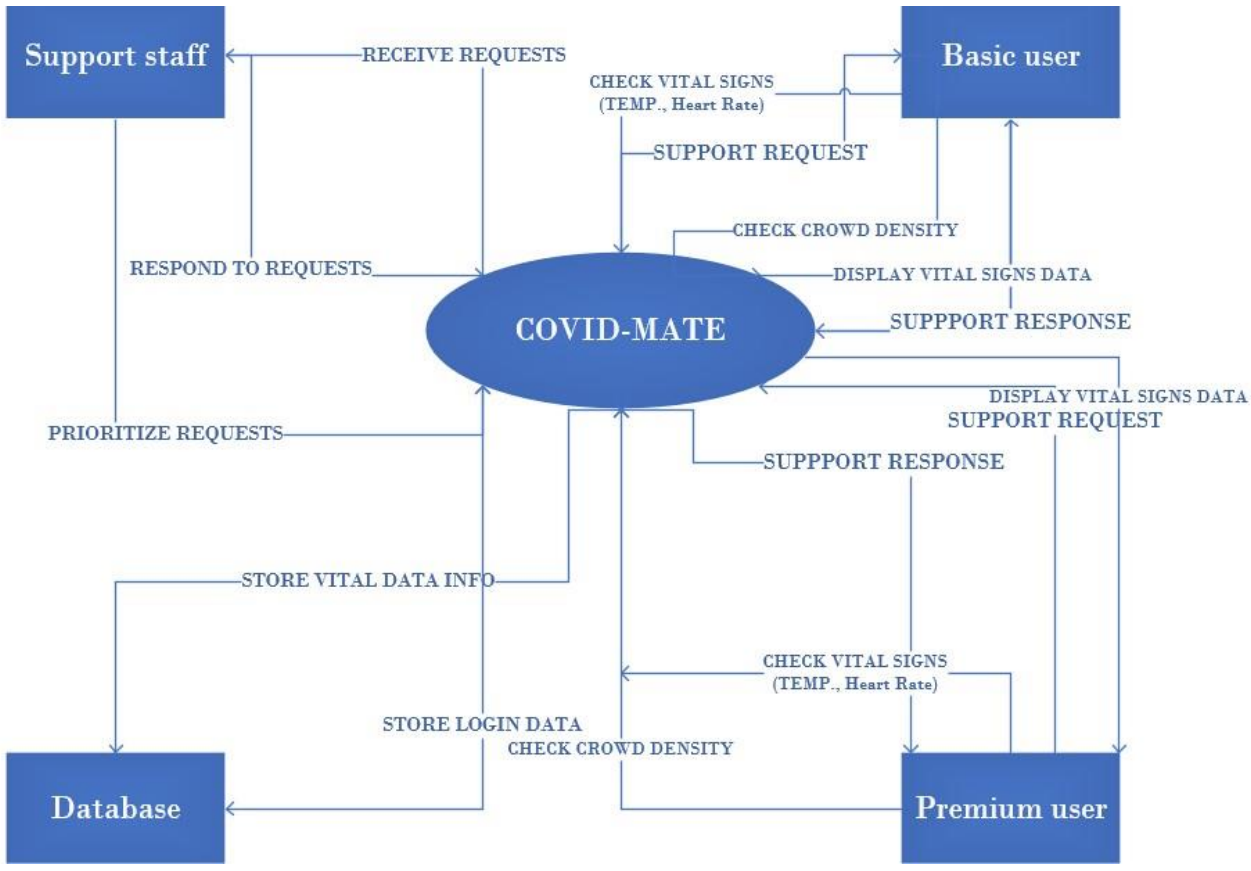
1. A login page for authenticating registered users. This is necessary as our app stores vital information from each user and hence, security is necessary.

2. A self-check page wherein a user can check their vital signs including temperature, heart rate etc.

3. A crowd checker page for determining the crowd at a given location at a given time.

4. A support page for reporting issues and contacting support personnel

We will be using Node.js for our backend needs as it offers high performance, has a cross-platform nature and is easy to use.



## 3.2. Hardware Interfaces

Hardware devices used in the software will be as follows:

1. Flashlight - the purpose of flashlight in our software will be to measure the heart rate(using the technique of photoplethysmography)
2. GPS - GPS will be used for mapping the location of the user to redirect him/her to the nearest COVID-19 test center, if and when necessary
3. Infrared Cameras- All objects emit infrared energy. And, the infrared camera will detect the infrared energy and convert the infrared data into an electronic image that shows the temperature of that surface

## 3.3. Software Interfaces

Third-party software planned to be used in our project will be as follows:

1. Flutter SDK - This kit is going to provide a platform for using the programming language "dart" which will aid the application to be compatible with both android and iOS.
2. Google maps API - The maps API's are needed for the crowd detection and redirection functionalities.
3. MySQL - The database solution used is MySQL for providing better storage. Moreover, it is multi-threaded, and easy to use SQL database.

## Appendix C

## Stakeholder Register(Deliverable 2)

| Stakeholder Name | Stakeholder position | External /Internal | Operational/ Executive | Contacts | Interest | Functions |
|---|---|---|---|---|---|---|
| **Guradaya Singh** | Director of accounting | Internal | Executive | tumber*20@gmail.com | High | Weekly expense report |
| **Binu Joseph** | Investor | External | Executive | Josephbinu2020@hotmail.com | High | Allocate capital in software |
| **Jiyeon Saku** | Project Manager | Internal | Executive | jiyejion@hotmail.com | High | Overlook development procedures, progress and mediate between customers and developerss |
| **Robin Farwahan** | IT administrator | Internal | Operational | Farwahan8aug*r@gmail.com | Medium | Conduct consistent analysis of computer systems and upgrades or updates as needed |
| **Dolsy Babu** | Marketing officer | Internal | Operational | hensalbabu09@comp.ca | High | Deals with marketing cycle |
| **William Jones** | App Administrator | Internal | Operational | WJones@outlook.com | High | Is in charge of running the app smoothly, releasing updates, |

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|---|---|---|---|---|---|---|
| | | | | | | manage and maintain security policies |
| **Mishkat Bakr** | Database Administrator | Internal | Operational | MBakr@gmail.com | Medium | In charge of creating, maintaining, and troubleshooting databases |

## Appendix D

## Interview Questions (Deliverable 3)

| Interview Questions | | |
|---|---|---|
| **Question** | **Stakeholder Position** | **Answer** |
| 1. What is the market demand for such an app? | Marketing manager | In these uncertain times, obtaining information has not been a problem since we are in the 21st century. But, our study reveals that 60% of people believe that much of the information available is scattered and cumbersome to look up. Hence, this app will be warmly welcomed by a large number of people. |
| 2. What kind of database system is used in your company? | Database Administrator | Oracle & MySQL |
| 3. What level of security will be required for the software? | IT administrator | There should be signup and login using google account or Facebook account and others. |
| 4. How often you need to be informed about the projects and which communication mode can is preferred? | Customer | The information can be given weekly and communication can be done through emails. |
| 5. Who will use the potential solution to be developed? | Customer | The solution will be used by the common masses to take precautions in these uncertain times. |

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|---|---|---|
| 6. What does your research suggest of predicted usage patterns for our app? | Marketing Manager | Our research suggests that users may use the app when they walk up, when they plan to go out. |
| 7. What is the preferred development platform, if any? | Application administrator | The preferred development platform is Flutter as it involves lesser code and higher compatibility for both android and iOS. |
| 8. What will be the economic benefit of a successful solution? | Marketing manager | An ideal solution would result in a gradual expansion in the user base, leading to more accurate crowd data. This in turn helps generate revenue from ads. Furthermore, the premium option will become more desirable, also generating revenue . |
| 9. What are the potential challenges we may face while developing this solution? | App administrator and database administrator | The challenges may include budget constraints, third-party software permissions and data processing limits among others. |
| 10. Is there anyone else who must be contacted? | Customer/Marketing manager/IT administrator | No, there is no one else you need to contact/<br>Yes, you could contact.... |

## Deliverable 4

## Functional requirements

| FUNCTIONAL REQUIREMENTS LIST | | | | |
|---|---|---|---|---|
| **Requirement ID** | **Requirement title** | **Short Description** | **Priority** | **Requester** |
| **FR01** | Vital Signs measurement | The app must measure vital data information, such as temperature with the aid of both phone sensors and infrared cameras, heart rates using mobile flashlights etc. | High | Customer |
| **FR02** | Busy times page | The app should allow users to check how busy a place is at certain times with the aid of google maps integration | High | Customer |
| **FR03** | Google maps integration | The app should allow the integration of google maps for redirection to COVID-19 testing centers as well as crowd density data | High | End Users |
| **FR04** | Notifications | The app should notify users of unfavorable results (temperature and heart rates) or any change in the crowd density/busy times | High | Customer |
| **FR05** | Vital signs data | The app must measure and display temperature, heart rate readings appropriately (as graphs, charts etc.) | High | Customer |

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|---|---|---|---|---|
| **FR06** | Testing centers page | The app must have a 'testing centers' page wherein users can locate the nearest COVID-19 testing center to approach in case vital signs data has not been normal. | High | End users |
| **FR07** | Admin permissions | The app must allow the admin to modify/delete user accounts for troubleshooting purposes | High | App Administrator |
| **FR08** | Update user data | The app must permit users to make changes to their existing data including name, address, among others | High | End users |
| **FR09** | Premium user profiles | The app must allow users to purchase a premium subscription to access additional features such as prioritized support, no ads etc. | High | Customer |
| **FR10** | Premium user profiles | The app must allow users to purchase a premium subscription to access additional features such as prioritized support, no ads etc. | High | Customer |
| **FR11** | Frequently Asked Questions | The app should have an FAQ section which is frequently updated by the admin for common queries of users | Medium | App Administrator |
| **FR12** | Chat support | The app must have a | Medium | Support |

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|---|---|---|---|---|
| | | support page wherein users can report and resolve issues | | personnel |

## Non-Functional Requirements

| NONFUNCTIONAL REQUIREMENTS LIST | | | | |
|---|---|---|---|---|
| **Requirement ID** | **Requirement title** | **Short Description** | **Priority** | **Requester** |
| **NFR01** | Prioritized chat | The app may prioritize requests of premium users and resolve it within 2 hours of opening | High | Support personnel |
| **NFR02** | Security | The app shall pass the following tests to ensure security: penetration testing, SQL injection testing and DoS testing | High | IT Administrator |
| **NFR03** | Login facility | The app shall support sign up and login using social media accounts including google, Facebook and others as well as biometric logins wherever possible | Medium | Customer |
| **NFR04** | Profiles | The app may have multiple profiles for various users using the same device, i.e., even though everyone has a phone these days, the sensors on some are inarguably better than others. The feature of profiles enables multiple users in a family/group to make use of their best | Medium | Customer |

| | | | | |
|---|---|---|---|---|
| | | sensors, while maintaining individuality | | |
| **NFR05** | OS support | The app may run on both iOS and android to widen the user base and for this the flutter development platform is to be used | Medium | IT Administrator |
| **NFR06** | Reminder alerts | The app may remind users to check their state, their upcoming trips and crowd data changes at custom-set times and dates | Medium | End users |
| **NFR07** | Data storage | The app shall be able to store up to 5000 users' worth data and shall consider scalability as a priority during database design | Medium | Database Administrator |
| **NFR08** | First-login demo | The app shall provide a demo on how to navigate through the User Interface for first time users who are completely unaware of the app | Medium | End users |
| **NFR09** | Search Bar | The app must have a search bar to enable users who are unfamiliar with the UI to find what they want fast and easily | Low | Customer |