**Project Planning**

**Project Task Decomposition**

A picture containing meter, parking, reading, sitting

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**Workflow**

**Resource Allocation**

**Schedule**

**Software Requirements Definition**

**Introduction**

To combat the pandemic of coronavirus COVID-19, experts in Public Health call for a virus tracking system to stop the spread of the virus in public areas.

The basic idea of the tracking system is to set all public in-door spaces as controlled areas. Typical examples of such areas are restaurants, pubs, shops, museums, schools, offices, cinemas, theatres, airports, waiting rooms of bus stations, public transportation vehicles (like buses, taxis, airplanes, ferry boats, trains), etc. Every individual person enters such a space must be recorded of the period of time that the individual stayed in the area.

**Overview of the document**

This document first reviews the target user types of the system and then defines the functional requirements of the system. In addition to this, it defines the non-functional requirements of the system along with the quality requirements and the design constraints.

**Types of Targeted Users**

The main types of the users of the system will be:

* Crownpass Holder - these are the users of the Crownpass: COVID-19 Tracking System. They will be people from the general public of all ages and backgrounds.
* Controlled Area Owners -
* System Operators -
* Test Centres -
* Central Government and Disease Control Centres -

**Functional Requirements**

The functional requirements of the system are grouped according to the types of users.

**Functional Requirements of Crownpass Holder**

* Search for nearest test centres - The system should enable a Crownpass Holder to use a smartphone app to search for the nearest test centres.
* Create a profile for Crownpass ID - The system should enable the Crownpass Holder to create a profile where they can register with their personal details for a Crownpass ID. This will contain their personal details such as their name, address, email address, contact number. It will also have a section where you can upload a photo using the guidelines mentioned for it to be used on your crownpass ID. After all these have been completed, it will be sent for verification by one of the system operators to check that the details and uploaded photo are appropriate for a Crownpass ID.
* Book a COVID-19 test - From a Crownpass Holder’s point of view is that the system should enable them to book a COVID-19 test if they wanted to get a test or if they were recommended or advised by the controlled area owners or by disease control centres for their own safety and to avoid risking the lives of others.
* Report a Crownpass ID as lost or stolen - A Crownpass Holder should be able  to report a Crownpass ID as lost or stolen which will notify the System Operators that the holder has had their Crownpass ID lost or stolen and that they will either need a replacement one or assistance to find their Crownpass ID.
* Receive notifications of possible COVID-19 - The Crownpass Holder would like the system to notify them when they are near another holder that is in the state of “Red” or “Amber”, tested positive or has developed symptoms, and to notify them to self-isolate when necessary.
* Receive alerts of overstay - The Crownpass Holder would like the system to alert them when they have exceeded their stay in a controlled area for more than 15 minutes or more than 2 consecutive days.

**Non-Functional Requirements**

The non-functional requirements of the system are grouped according to the types of users.

**Non-Functional Requirements of Crownpass Holder**

* Usability - Crownpass Holder should be able to understand the flow of the app easily. They should be able to use it without any guidance or help from experts/manuals. If user experience needs to be explained, then it is not good UX.
* Reliability - The app should be reliable to perform the action that it is meant to do and when the Crownpass holder performs some important action, it should be acknowledged with a confirmation, also the app should not shut down or stop working in between due to overload or high usage. If the system is not very reliable, then the number of users will go down very fast. This will result in a waste of time and resources creating the system due to the loss of customers.
* Security - All the app data and Crownpass holder’s information should be secured and encrypted with minimum needs so that it is protected from potential hackers and to avoid breaching the GDPR and Data Protection Act 1998.
* Availability - Crownpass Holders should be aware that the app is available to install from the App Store (iOS) or Play Store (Android). They should also be able to rate the app and be able to contact support if they need any further assistance. It also needs to be available 24 hours a day, 7 days a week, which means that users of the app can use it at any time during the day or night.
* Screen Adaption - The app should be adjustable to the device that this is being used on.
* Network Coverage - The app should work well with Wi-Fi, but also should allow for switch to mobile networks when Wi-Fi is not available. Crownpass Holder should be notified via an alert/warning message to notify the holder that there is an issue loading up the barcode.
* Performance - When the Crownpass holder uses their phone to get the barcode, it should load up within 3 seconds fully. If this takes a long time to open up, then this will result in a delay in checking into the controlled areas and causing a delay and disturbance in the service provided to the customers as well as other potential customers queuing behind them.
* Maintainability - It is very important to make sure that the app is well maintained and presented to the highest quality otherwise customers might not be happy about the way the owner of the app is representing themselves and might result in a damaged reputation.

**Quality Requirements**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description of each aspect** | **Aspect** | **Attribute** | **Measurement Unit** | **Precision** | **Value** |
| A list with all the nearest testing centres should be displayed with 5 seconds | Testing Centres Search function list | Response time | Seconds | 0 decimal | <5 seconds |
| When a Crownpass uses their phone to get the barcode, it should load up within 3 seconds fully | Barcode function | Load time | Seconds | 0 decimal | <3 seconds |
| The uploading photo functionality should load up within 5 seconds | Upload Photo function | Load time | Seconds | 0 decimal | <5 seconds |
| The photo verification request should be sent to the System Operators within 8 seconds to verify and check if it is a valid photo or not | Photo Verification request | Send time | Seconds | 0 decimal | <8 seconds |
| The photo verification response should be sent to the Crownpass Holder from the System Operators within 15 seconds | Photo Verification response | Send time | Seconds | 0 decimal | <15 seconds |
| The Crownpass ID number should be generated within 10 seconds | Crownpass ID Number generation response | Generation time | Seconds | 0 decimal | <10 seconds |
| After a Crownpass Holder enters their login details and clicks login, they should be in the system within 2 seconds. | Login function access response | Response time | Seconds | 0 decimal | <2 seconds |
| When a Crownpass Holder is near another holder with a possible COVID-19 virus, then the system should notify the Crownpass Holder within 3 seconds from being near them | Possible COVID-19 notification response | Response time | Seconds | 0 decimal | <3 seconds |
| When a Crownpass Holder has a possible COVID-19 virus, then the system should notify them within 3 seconds to self-isolate | Self-isolation notification response | Response time | Seconds | 0 decimal | <3 seconds |
| When a Crownpass Holder has overstayed at a controlled area, the system should alert them within 3 seconds | Overstay notification alert response | Response time | Seconds | 0 decimal | <3 seconds |

**Design Constraints**

* System interface - Screen size, sensors and interactions are one of the key design constraints when it comes to creating an app. It needs to be simple with enough space for the users of the app to touch and interact with the different elements. They might use this with one hand or two hands or use any of gesture support features to interact with the app. Depending on the operating system that the app will be using, there will be various screen sizes and resolutions to consider.
* Network issues - internet connection
* Capacity of the database (storage and cache sizes) - Another design constraint is the option to download and store/cache data content for offline usage. It will help reduce the data transfer for online activities, ensuring it is more responsive. It would be necessary to also consider that the user might delete/modify content on storage and the amount of storage and possibility of cached data getting connection
* Latencies – operation times and load times are another key design constraint especially when users on a mobile expect an instant response for something they do.

**References**

* Ian Sommerville, Software Engineering, 9th ed., Addison-Wesley, 2011
* Hong Zhu, (2020), ‘COMP6030-2020-Lecture 3 - Requirements Engineering’, PowerPoint presentation, COMP 6030: Software Engineering, Available on: Moodle under the Module name, (Accessed on October 2020 - November 2020)

**Requirements Elicitation Plan**

**Introduction**

In this document, I plan to find out more about the requirements and to get clarification on things that are not clear. The elicitation technique that is going to be used is an interview. By conducting an interview, it will help to gain a better understanding of the requirements of the COVID-19 Tracking System and the user type, Crownpass Holder.

**Interview Questions**

* How long does the status stay in Amber or is there a particular criteria for holders in those statuses before it can be changed? Does the status reset to Green after the number of days in self-isolation?
* How is the overstay being tracked? Is this based on the time in between check in and check out?
* When a Crownpass Holder receives an social distancing violation order, are they expected to self-isolate or get a test (both)?

**Interview Plan**

Below is a plan for the interview that is due to take place with the client to discuss and understand the requirements for the Crownpass Holder role better and how the COVID-19 Tracking System should work.

|  |
| --- |
| **Crownpass: COVID-19 Tracking System:** Interview Plan |
| **Reference:** COMP6030 - Software Engineering |
| **Participants:**  Group 8 members (Requirements Engineers)  Hong Zhu (Client) |
| **Date:** Thursday 15th October 2020 |
| **Time:** 15:10 |
| **Duration:** 10 minutes |
| **Location:** Zoom Meeting |
| **Purpose of the Interview:**   * Meeting to discuss and understand the requirements regarding software system for Crownpass: COVID-19 Tracking System |
| **Agenda:**   * To get clarification on the requirements in regards to the Crownpass Holder through the pre-prepared interview questions * To develop and gain a deeper understanding of the Case Study and what is required to successfully complete the parts required for Crownpass Holder. |
| **Documents required for the interview:**   * Pre-prepared Interview Questions * Coursework Case Study: Crownpass - COVID-19 Tracking System |

**Conclusion**

By conducting this interview, I will have all the relevant information needed to successfully complete the parts of the Crownpass Holder and to combat the pandemic of coronavirus, COVID-19 and to help the experts in Public Health to stop the spread of the virus through the tracking system. The interview has also helped me to understand the requirements better.

**Software Modelling**

**Use Case Description**

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| --- | --- |
| **Use name:** | Create a profile for Crownpass ID |
| **Description:** | A Crownpass Holder uses a third-party website to register for a Crownpass ID |
| **Participating Actor:** | Crownpass Holder  System Operators |
| **Preconditions:** | The Crownpass Holder must have access to the internet in order to access the third-party website to create a profile for the Crownpass ID so they can register. |
| **Postconditions:** | A request to create and generate a Crownpass ID will be recorded in the system or if the user fails to follow the photo upload guidelines or does not enter the mandatory details, then the system will display an error message and will not allow the Crownpass Holder to create a profile for registration. |
| **Basic Flow:** | * Crownpass Holder goes to third-party website * System displays third-party website * Crownpass Holder clicks on Register * System displays Registration form for Crownpass ID * Crownpass Holder enters personal information * Crownpass Holder uploads photo using guidelines * Crownpass Holder completes form * If Crownpass does not fill out mandatory details, then the system will display an error message. * Crownpass Holder submits form for verification by System Operators * If verification has failed, then they have to re-submit the form following the notes provided by the system operator. * If verification has passed, then the system will generate a Crownpass ID number * Once the Crownpass ID number has been generated, it will display a list of options on how the Crownpass Holder can get their Crownpass. This will be Scan, Print, Email or Download. |
| **Exceptional flows:** | * Instead of ‘Submit Form for Verification’, crownpass holder might click on ‘cancel registration’   In this case, the form and the information inside the form will not be stored. |
| **Special requirements:** | * Following on from successful verification, generated Crownpass ID number must be delivered within 30 seconds |

**Use Case Model**

Below is the Use Case Diagram which was created using Eclipse’s tool called Papyrus for the Crownpass Holder who is creating a profile to get a Crownpass ID.

Diagram

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**Activity Model**

Below is the Activity Diagram which was created using Eclipse’s tool called Papyrus for the Crownpass Holder who is creating a profile to get a Crownpass ID.

Diagram

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**UML Structural Model**

**Behavioural Model**