
Software Requirements Specification

for

Air Pollution Awareness via Photo Sharing (AP)

Version 0.1

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January 2023

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Revision History

Name	Date	Reason For Changes	Version
AP	15/01/23	First Version	0.1

1. Introduction

1.1 Purpose

The purpose of this document is to describe the requirements for the Air Pollution Awareness via Photo Sharing (AP) project. The intended audience includes all stakeholders in the potential system. These include, but are not necessarily limited to, the following: application users, customers, social media photo audience, air quality data providers, and developers.

Developers should consult this document and its revisions as the only source of requirements for the project. They should not consider any requirements statements, written or verbal as valid until they appear in this document or its revision.

1.2 Scope

The proposed software product is the Air Pollution Awareness via Photo Sharing (AP) application. It reports the actual and forecasted air quality information in the user's location. Additionally, it allows users to customize their photo to include air quality information and to upload to social media.

The goal for Air Pollution Awareness via Photo Sharing (AP) application is to raise awareness about air pollution, specifically in Chiang Mai and Thailand via photo sharing. Photo sharing has been popular in social media. By enabling users to customize their photo with air quality information easily could help them communicate with others about the air pollution in their communities, potentially raising awareness of air pollution in the communities. People could know how to protect and prepare themselves against air pollution.

1.3 Definitions, Acronyms, and Abbreviations

Table 1. Definitions

Term/Acronym/Abbreviation	Expansion/Description
Metadata	Information embedded in the image file
Fetch	Requests and retrieves resources from a server
Overlay	A separate layer on top of an existing image that contains air quality information
Widget	Building block of the user interface

Table 2. Acronyms/Abbreviations

GPS	Global Positioning System
API	Application Programming Interface
AQI	Air quality index
UI	User interface
AP	Air Pollution Awareness via Photo Sharing
SRS	Software Requirements Specification
CPU	Central Processing Unit
RAM	Random Access Memory
GB	Gigabyte
GHz	Gigahertz
REQ	Requirement
HTTPS	Hypertext transfer protocol secure
JSON	JavaScript Object Notation

1.4 References

Template-SRS-iso-iec-ieee-29148-2011.pdf

<https://mango-cmu.instructure.com/courses/1577/files/206713?wrap=1>

A2 - Software Requirements Specification (SRS) Assignment Page

https://mango-cmu.instructure.com/courses/1577/assignments/8698?module_item_id=38180

AreYouWorking Team's website

<https://areyouworking.github.io/>

1.5 Overview

This Software Requirements Specification (SRS) is the requirements work product that formally specifies Air Pollution Awareness via Photo Sharing (AP) project. It includes the results of both business analysis and systems analysis efforts. Various techniques were used to elicit the

requirements and we have identified your needs, analyzed and refined them. The objective of this document therefore is to formally describe the system's high level requirements including functional requirements, non-functional requirements and users' needs and constraints. The detail structure of this document is organized as follows:

Section 2 of this document provides an overview of the functionalities that the proposed Air Pollution Awareness via Photo Sharing (AP) project will support. These include a general description of the product, user characteristics, general constraints, and any assumptions for this system.

Section 3 presents the detailed requirements, including User Interfaces, Hardware Interfaces, and Communication Interfaces. It describes about

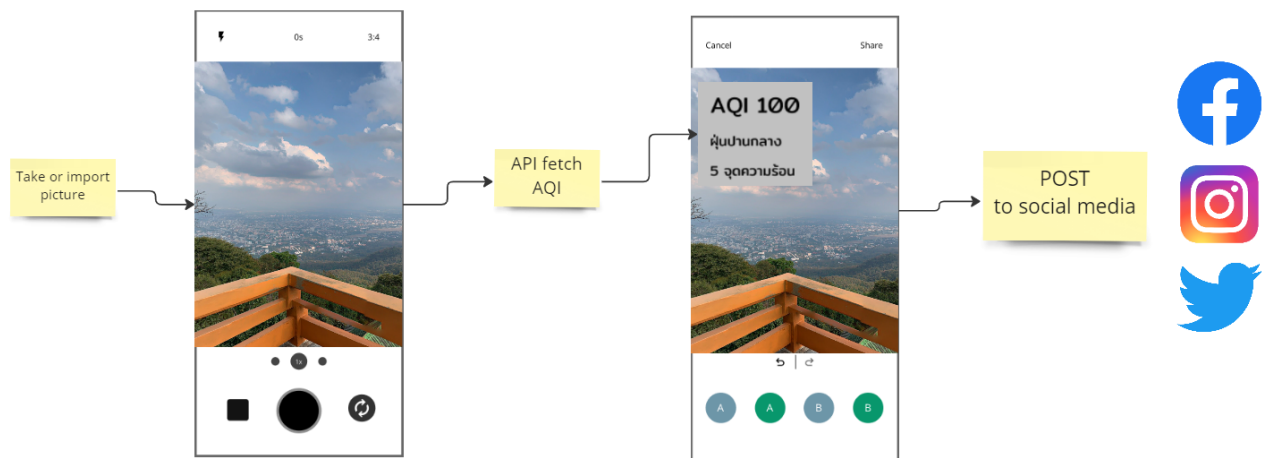
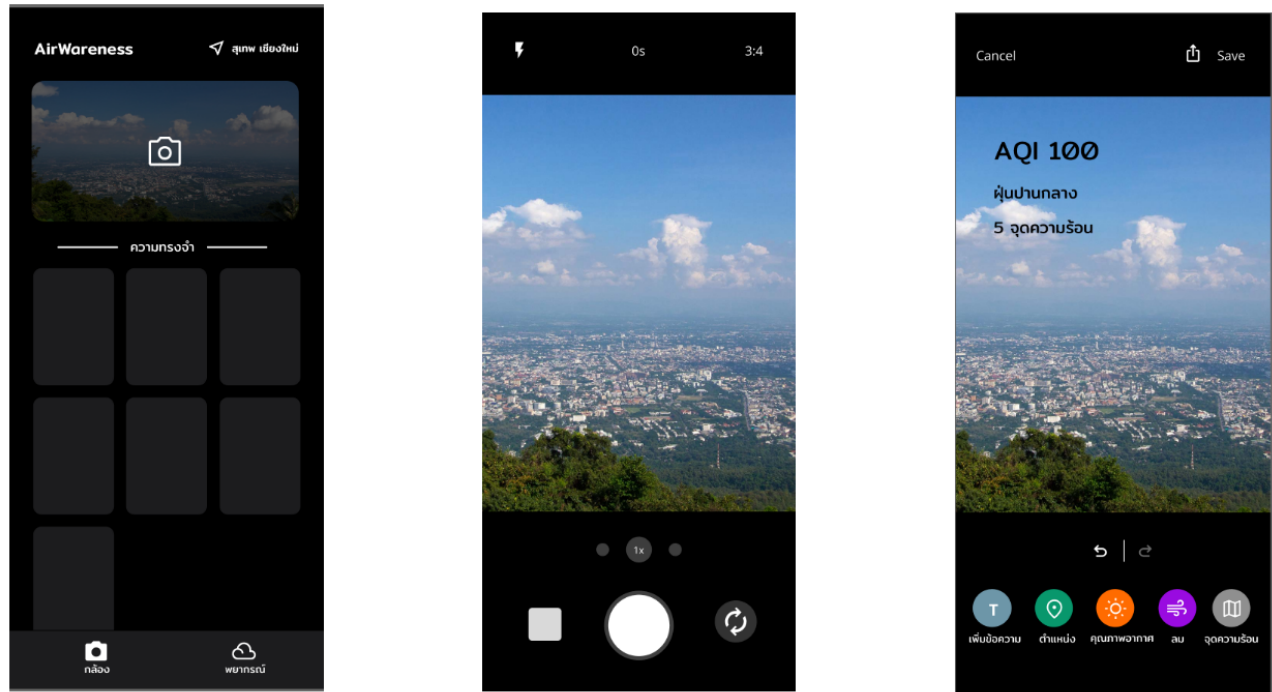
Section 4 describes four features of an app, including a "Take Photo" feature that allows users to take a photo within the app and save it to a designated album or folder, a "Edit Photo with Air Quality Info" feature that allows users to edit photos by overlaying air quality data and customizing the appearance of the overlay, a "Share a Photo to Social Media" feature that allows users to share photos to social media platforms with captions, hashtags, and privacy settings, and a "View Current/Predicted Air Quality" feature that allows users to view the current AQI, predicted AQI, and historical data for a specific location. All of these features are high or medium priority.

Section 5 describes other non-functional requirements for an app, including performance requirements for small size, quick opening and use, and ability to support multiple requests at the same time. Safety requirements include preventing data loss by preventing crashes while editing photos. Security requirements include compliance with terms and conditions of 3rd party APIs, secure and private retrieval of air quality data and allowing users to choose to allow access to device's location, storage, and camera. Additionally, the software quality attributes include easy to use for everyone and fast UI response and loading.

2. Overall Description

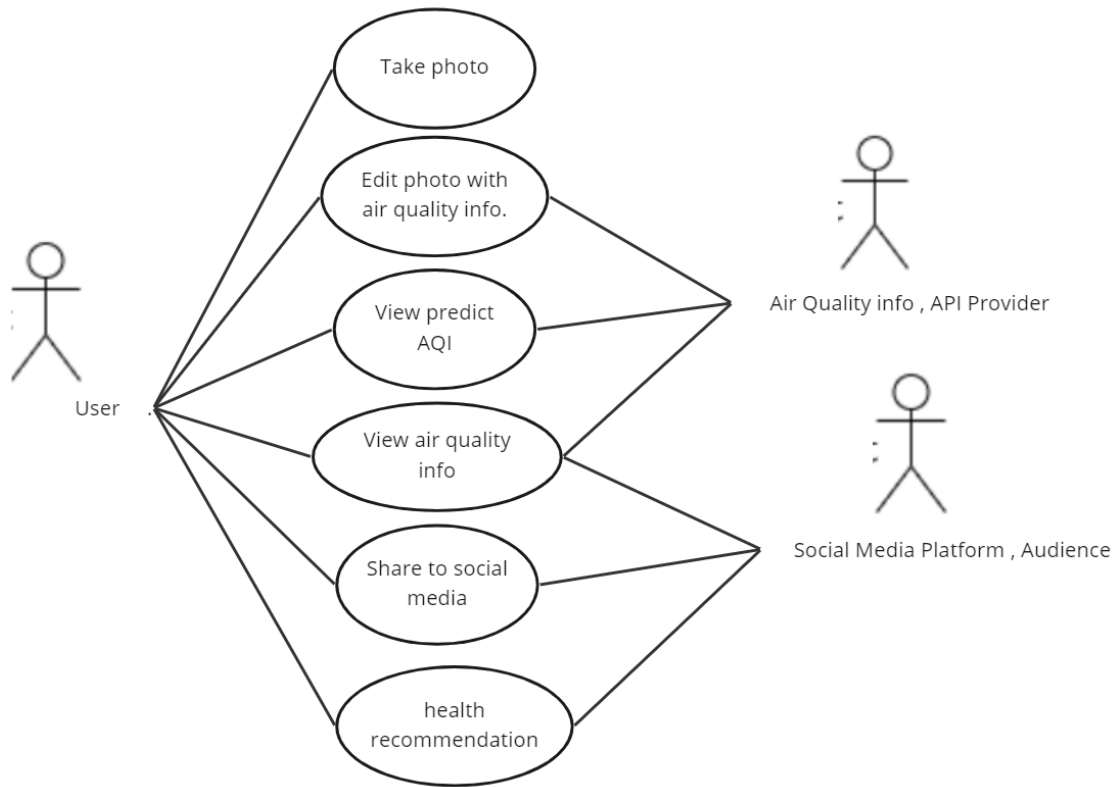
2.1 Product Perspective

The Product Perspective of Air Pollution Awareness via Photo Sharing (AP) is an application that aims to raise awareness about air pollution by enabling users to share photos of polluted areas in their communities. The AP platform is designed to be user-friendly and accessible to people of all ages, allowing anyone with a smartphone or other device with a camera to participate.



The AP application includes the ability to take and edit photos with air quality information, viewing air quality forecasting, and history of shared photos.

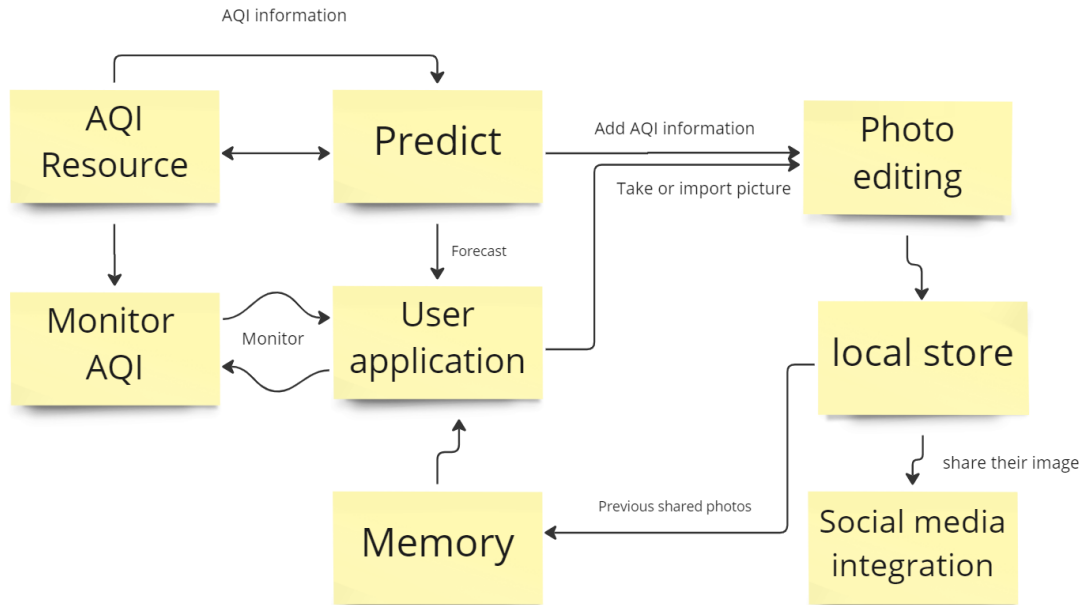
The AP application also includes resources and information about air pollution and its impacts on human health and the environment. This includes information about the causes of air pollution, such as industrial and transportation emissions, as well as strategies for reducing pollution and improving air quality. The following is the use case diagram of the AP application.



Overall, the goal of the AP application is to address and raise awareness about air pollution in their communities. By sharing photos and information about polluted areas, users can help raise awareness about the issue and encourage others to take action to reduce pollution and improve air quality.

2.2 Product Functions

- Allow users to view real-time and hourly and daily forecasted air quality data for their current location or any location they choose.
- The users can choose their location using GPS, or searching for their location.
- Air-quality data can be overlaid onto the images taken with the AP app, providing users with a visual representation of the air quality in their area.
- Hot spot information: a feature that allows users to view hot spots, or areas of high heat that may be contributing to air pollution.
- Hot spot maps can also be overlaid onto the images taken with the app.
- Allows users to easily share their images and data to social networks such as Facebook, Twitter, and Instagram. This helps to spread awareness about air pollution and encourages others to join the conversation.
- Allows users to save their edited photos onto their devices.
- Allows users to browse their previous shared photos.



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- Easy to use: AP is designed with a user-friendly interface, making it easy for anyone to use. The app includes clear instructions and a simple navigation system, making it accessible to users of all levels of technical expertise.
- Health recommendation for users. This includes information about the causes of air pollution, AQI guide, health impact, how to protect and prevent.

2.3 User Characteristics

- Typical Users, such as those who often spend time outside, Instagrammer, social media users.
- Users who like to know more about air pollution.

2.4 Operating Environment

Designed to work on Android devices, including smartphones and tablets . The app requires Android version 5.0 or higher to run properly and optimized to work on all screen sizes, including small smartphone screens and larger tablet screens. The app is designed to automatically adjust to the size of the device it is being used on, ensuring that it is easy to use and read on any device.

2.5 Design and Implementation Constraints

The AP is developed using Flutter for Android devices. Flutter is an open-source mobile application development framework created by Google. It is used to develop applications for Android, iOS, Linux, Mac, Windows and the web. Flutter uses the Dart programming language, which was also created by

Google. One of the key features of Flutter is its use of a reactive programming model, which allows developers to build high-performance, responsive user interfaces. Additionally, Flutter includes a rich set of customizable widgets and tools for building beautiful, natively compiled applications for mobile, web, and desktop.

The AP uses 3-rd party Air-quality APIs which provide real-time air-quality data as well as hourly, and daily forecast.

The AP uses 3-rd party location service APIs to provide recommended locations for users to choose from. These APIs provide access to device's location service and allows users to search for a custom location from a 3-rd party database.

The AP must follow the guidelines and best practices for data privacy and security, regarding user's location, photos, storage and API usage.

The user can choose to allow access to their device's location service, camera, and storage. The AP application must continue to work, but limiting functionalities that use the unpermitted service.

The application will have minimum hardware requirements such as a device with at least 1 GB of RAM, and a CPU with a minimum clock speed of 1 GHz.

2.6 Assumptions and Dependencies

Assumptions:

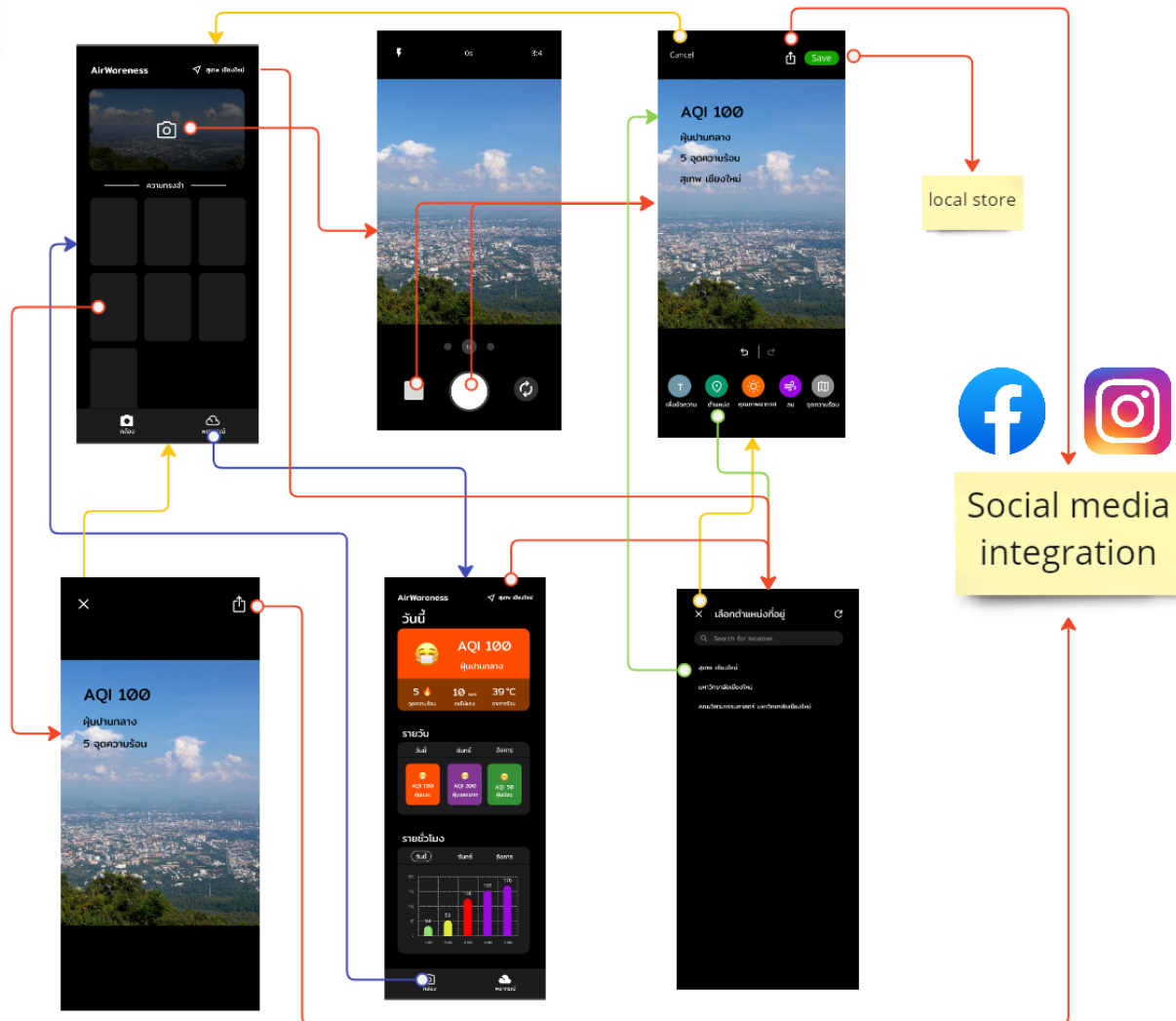
- Users have a device with internet connection to use the application.
- Users have a social media account to share the customized photos.
- The third-party API used for retrieving air quality information is reliable and accessible.
- The location service API is reliable and accessible.

Dependencies:

- Flutter framework for development and building the application.
- A third-party API for retrieving air quality information.
- Location services to provide accurate air quality information.
- Social media integration for photo sharing functionality.
- A device with internet connection to use the application.
- Users must have an account in social media to share the photos from the app.

3. External Interface Requirements

3.1 User Interfaces



The first page the user sees when they open the app is the camera screen. This screen lets the user take a photo and browse their previous shared photos. The user can see their photo in full screen when they press on it. The user can switch to the forecast screen using the navigation buttons below. On the top right of both screens shows the user's location. The user can press on that button to search for a location, or select using the device's location service. The forecast screen includes air quality data as shown. It features hourly and daily forecasts. After the user selects a photo from their gallery, or takes a photo, the app will take them to the photo editor screen. This screen lets the user customize their photo with air quality data. The user can save the edited photo onto their device, and share it to social media. The buttons below in the photo editor screen lets the user add more widgets

onto the photo. The user can double press on a widget to change appearance. They can select a preset layout to be overlaid on their photo by swiping the screen left and right.

3.2 Hardware Interfaces

1. The AP application will require internet connectivity to access the third-party API and retrieve air quality information.
2. The application will also require access to the device's location services in order to provide accurate air quality information.
3. The application will need access to the device's camera and photo library to allow users to customize photos with air quality information.
4. The application will also require access to the device's social media accounts to enable photo sharing functionality.
5. The application will require access to the device's storage to save photos.
6. The AP application is designed for mobile devices, it will be compatible with Android.
7. The application will work on both smartphones and tablets.
8. The application will be tested on various devices to ensure compatibility and optimal performance.
9. The application will be optimized for portrait orientations.
10. The application will be able to run on devices with different screen resolutions and sizes.

3.3 Software Interfaces

AP requires Android version 5.0 and above. More information can be on section 2.4 of this document.

3.4 Communications Interfaces

- The AP application uses internet connection to retrieve air-quality data, location data, and to share photos in social media.
- The application uses HTTPS for communicating with air-quality API and social media API.
- The application uses JSON format for data exchange with the API.
- The application must be able to handle error and provide appropriate feedback in case of communication error.
- The application must comply with guidelines and best practice for data privacy and security.

4. System Features

4.1 Take photo feature

Users should be able to take a photo in our app with no need to swap to the camera app. This is HIGH priority.

- REQ-1: The camera should be activated upon pressing the "Take Photo" button or through a designated gesture such as volume button.
- REQ-2: The user should be able to preview the photo on the screen before saving or discarding it.
- REQ-3: The photo should be saved in a designated photo album or folder on the phone's internal storage or external storage.
- REQ-4: The app should support zoom in/out while taking photos.
- REQ-5: The app can switch to use front or rear cameras.
- REQ-6: The app must support taking photos in both landscape and portrait orientation.

4.2 Edit photo with air quality info feature

Users should be able to edit the imported or taken photo inside the app. This is HIGH priority.

- REQ-1: The user should be able to select a photo from their camera roll or take a new photo to edit.
- REQ-2: The app should be able to access the device's GPS or location services to determine the user's current location or user selected location.
- REQ-3: The app should be able to retrieve real-time air quality data for the user's location from a reputable source, such as a government agency or research organization.
- REQ-4: The app is able to overlay the air quality data, such as the current AQI (Air Quality Index) and the level of pollutants, onto the photo.
- REQ-5: The user should be able to customize the appearance of the air quality data overlay, such as the font, color, and size.
- REQ-6: The app should be able to save the edited photo in a designated folder or album on the phone.
- REQ-7: The app should be able to undo , redo the edit photo state.
- REQ-8: The user can choose their own location from GPS, recommended locations based on GPS, photo's metadata, or their own searched location.

4.3 Share a photo to social media feature

Users should be able to share the edited or taken photo from inside the app to social media like Instagram, Facebook, Twitter etc. This is MEDIUM priority.

- REQ-1: The user should be able to select from a list of social media platforms to share the photo, such as Facebook, Instagram, Twitter, and others.
- REQ-2: The user should be able to add a caption and hashtags on the photo before sharing.
- REQ-3: The app should provide the user with a notification or confirmation when the photo has been successfully shared.

4.4 AirQuality Forecast System

Users should be able to access and view information about the air quality in the specific location.

- REQ-1: The app should be able to access the device's GPS or location services to determine the user's location.
- REQ-2: The app should be able to retrieve real-time air quality data for the user's current location from a reputable source, such as a government agency or research organization.
- REQ-3: The app should be able to display the current AQI (Air Quality Index) and the level of pollutants for the user's location.
- REQ-4: The app should be able to predict the AQI for the next few days, providing the user with a forecast of the air quality.
- REQ-5: The user should be able to select a different location to view the AQI and forecast.
- REQ-6: The app should be able to provide the user with historical air quality data for the location.
- REQ-7: The user can choose their own location from GPS, or their own searched location.

4.5 Previous Edited/Shared Photo (Photo Memory)

Users should be able to view previous edited or shared photos that will look like Instagram story archives (which we'll call memory).

- REQ-1: Users should be able to view previous edited/shared photos on the memory.
- REQ-2: Users should be able to delete previous edited/shared photos from the memory.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The AP application must be small in size and can be opened and used quickly. The 3-rd party APIs must be able to support multiple requests at the same time.

5.2 Safety Requirements

The AP application must not crash while the user is editing a photo to prevent data loss.

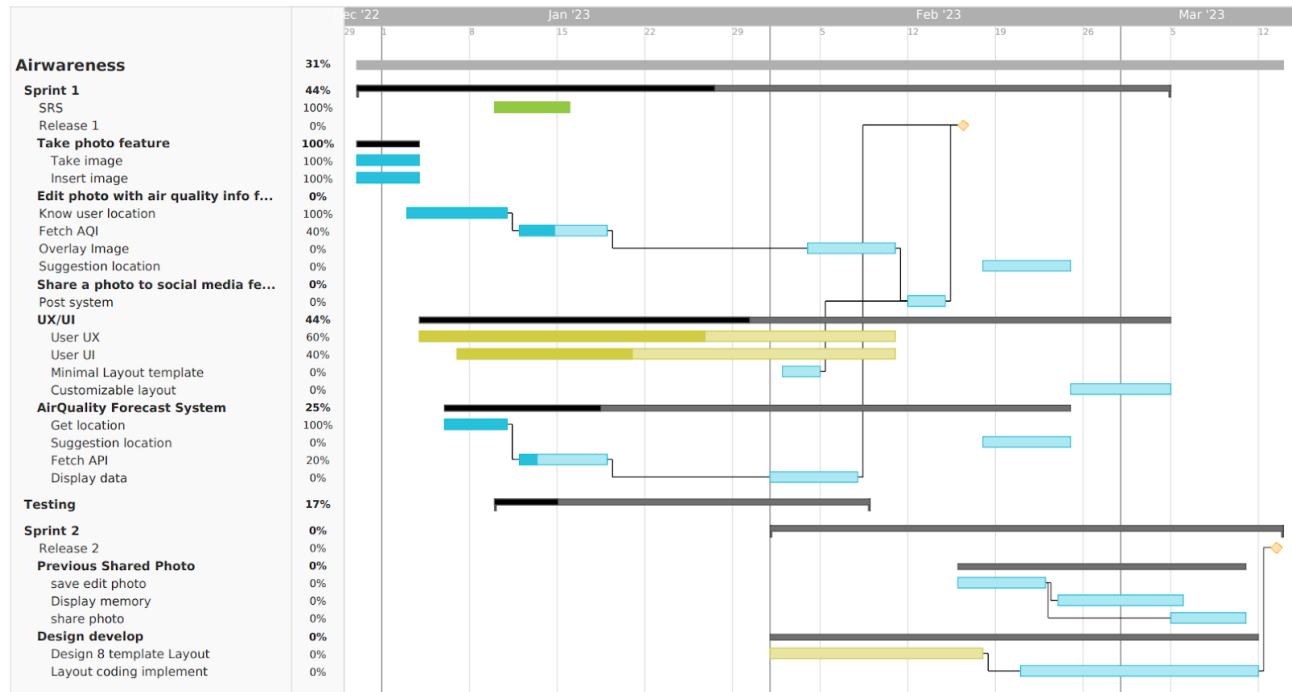
5.3 Security Requirements

- User's location must not be kept or publicized.
- The AP application must comply with terms and conditions of 3-rd party APIs.
- The user can choose to allow access to their device's location service, storage, and camera.
- The user's location is used to retrieve air quality data. The retrieval must be done securely and privately.
- The AP application saves the shared photo onto the user's device. The user can choose to delete it anytime.

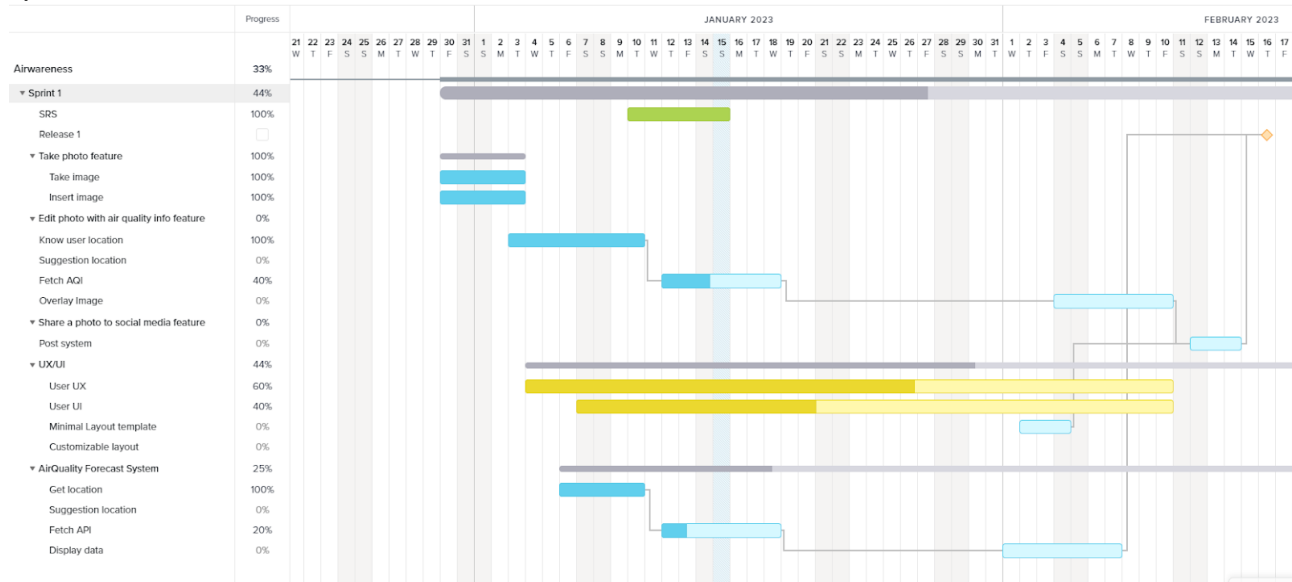
5.4 Software Quality Attributes

- The AP application is easy to use for everyone.
- The UI responds fast and loads quickly.

Appendix A: Work Plan

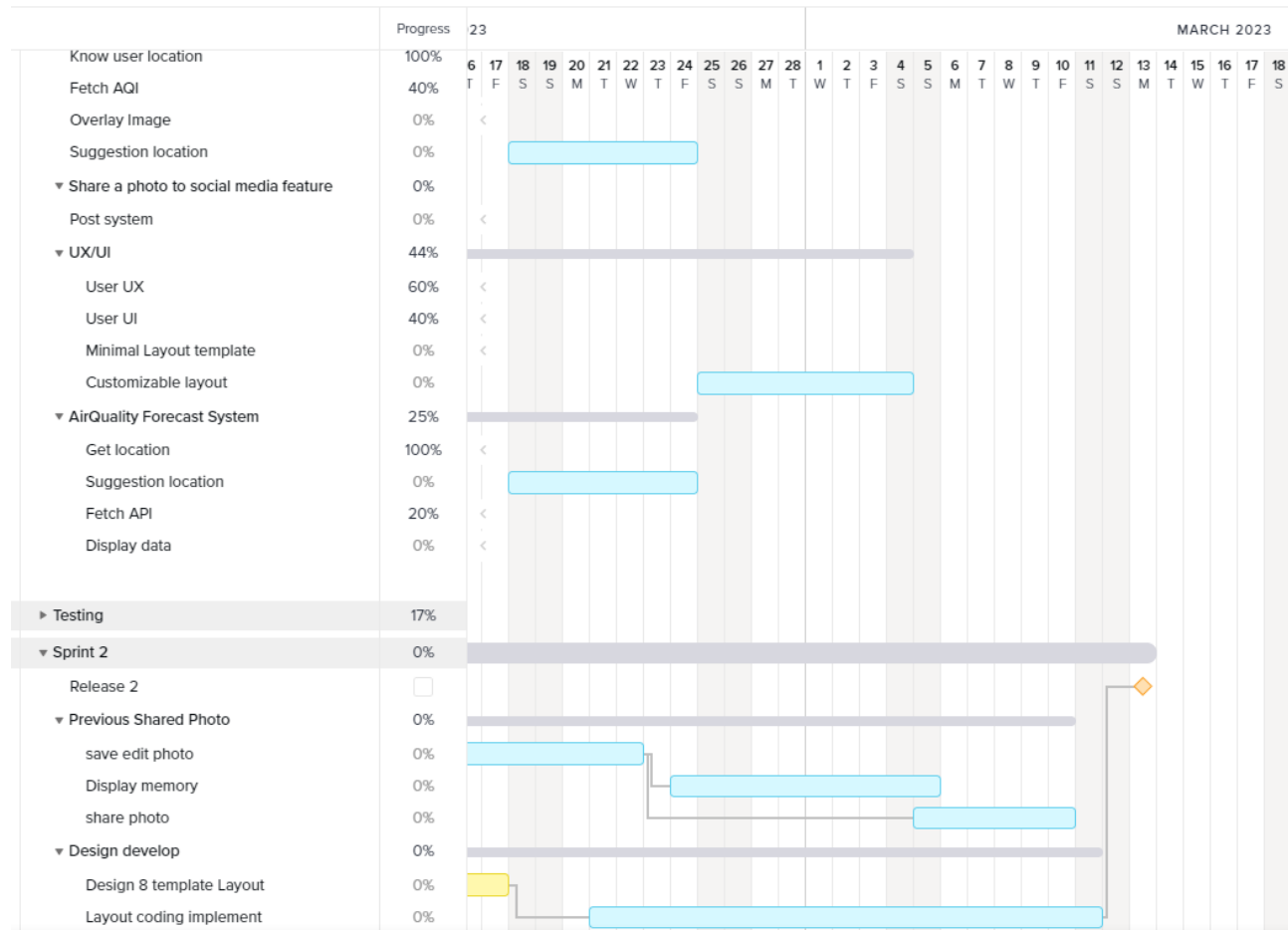


Sprint 1 :



- Implement all of the requirements of the AirQuality Forecast System in the “System Features” section.
- Should implement some of “Take photo feature” and “Edit photo feature” requirements.

Sprint 2:



Sprint 2

- Implement the remaining requirements of “Take photo feature” and “Edit photo feature”.
- Implement all of the requirements on “Previous Edited/Shared Photo (Photo Memory)” and “Share a photo to social media feature”
- Improve UI/UX on all of the features implemented.

Appendix B: Contribution

From the number of lines written and the number of manhours.

Tanat Tangun 630610737 (20.00%)

- Write most of the “System Features” section and some of section 1.5.
- Help plan and write on “Appendix A: Work Plan”

Tanadol Deachprapakorn 630610734 (22.50%)

- Write most of section 1, section 2.3, 2.5, 2.6, most of section 3.

Thanawat Bumpengpun 630610736 (15.00%)

- Write section 1.3 Definition/Acronym tables and review section 1,2,3,4.

Pongsakorn Rattanapan 630610749 (22.50%) : write most of the

- Other Nonfunctional Requirements 5.1 5.2 5.3 5.4
- External Interface Requirements and
- Some part in Overall Description”
- review section 2 and 4.
- Meeting and deciding with friends which function should have and which should not have.
- Decide together with friends which functions will not be available in version 1.
- Make a project plan and brainstorm to make it.
- Make all images in this report.

Purich Seenuallae 630610752 (20.00 % from the contents I write and wireframe)

Design a user-friendly and efficient interface for Wideframe, a platform that allows users to quickly create and customize interactive frames for digital content.

I create wireframes and mockups of the interface by Figma. I focus on creating a streamlined flow that allows users to easily create and customize interactive frames within the platform, while also providing advanced options for more experienced users.

I have written most of the SRS document in Section 2 and have also reviewed the entire document, including sections 1, 2, 3, and 4. I have also attended and presented the wireframes during an online meeting with the team.