Task 1 OSC

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Contents

1.0 Business Context

Health Advice Group is a charity that offers information and support for environmental health issues. They provide advice on how to deal with extreme weather temperatures, information on environmental health conditions and seasonal allergies (e.g., asthma, hay fever) and risk assessments for home environments. The client (the trustees of Health Advice Group) would like to develop a digital solution that provides weather forecasting to inform health decisions, access to a dashboard for monitoring air quality data and advice on how to deal with health matters affected by weather and environmental conditions. The client has done some market research to identify features that could be included in the digital solution. The potential features suggested by the client are personalized health advice based on location, accessibility features to support a wide range of user needs and a personal health tracking tool.

1.1 Stakeholders

Stakeholders are directly or indirectly involved/affected by the development of the solution.

Stakeholders	**Relation**	**Desired Outcome**
Health Advice Group	Health Advice Group are the primary stakeholder to the digital solution. They will distribute the solution to the public. The success of the digital solution is critical to the charity as it can have a positive or negative impact. If the solution is successful, the charity could benefit from increased donations and funding. On the other hand, if the digital solution is not successful or does not work as intended, it could warrant negative media attention and potential legal liability, due to the importance of the solution.	The charity will be hoping for a digital solution that they can release to help support the end user. They will want the solution to follow laws regarding data security and copyright.

The trustees of Health Advice Group	The trustees of the Health Advice Group charity are the client the solution is made for.	The client will be expecting a solution that meets all the requirements they set. They will be expecting a solution that they will be approved by the charity for deployment.
The developers	The developers are responsible for creating the digital solution.	The developers will be hoping for a solution they can complete within a realistic deadline.
API providers	The API providers provide the API for the charity to use in their solution. These APIs could vary from air quality APIs to map APIs.	The API providers will be hoping for a solution that advertises good use of their API. They will be hoping to potentially attract new users.
The end user	The end user will benefit from the developed solution. The number of users and the feedback they provide are important to the charity as if they find the solution useful, it may create positive attention for the charity, who could benefit from increased donations, investment etc.	The end user will be expecting a solution that is functional, friendly and secure. They will be hoping that the solution is useful and gives good advice to them based on their health and the environmental conditions they are in. As well as this, the user will hope that the weather forecasts and data that the solution displays are accurate.
Government		

1.2 Constraints

Constraints are potential challenges that could be faced during the project. It is important that they are managed and any potential risks to the project's development are mitigated.

Constraint	**Reason**	**What can be done**
Time	The solution will need to be developed within a specified timeframe.	During development, the features that have the highest priority and that are asked to be implemented by the client should be worked on first to ensure that the base solution can be created on time. If developers are struggling to

		develop the solution on time, features of lower priority e.g., quality of life features can be scrapped to save on development time. Resources should also be allocated efficiently; each developer should be given a specific task to complete and should be given a deadline.
Resources	Resources will need to be allocated e.g., developers to develop the solution.	Resources need to be used efficiently during development. For example, each developer should be assigned a specific task to complete to speed up development.
Money	The solution will need to be developed within budget.	A budget should be assigned for the project, and it should be monitored through development. If the project is at risk of going overbudget, some features could be removed from the solution to save money e.g., features that have less priority.

1.3 Non-functional and functional requirements

Functional requirements are the features of the solution, whereas non-functional requirements are the qualities of the solution.

Functional Requirements	**Priority**	**Non-Functional Requirements**	**Priority**
The solution should take the location of the user.	High	The solution should be compatible with most devices e.g., phones, tablets and computers.	High
The solution should give the user personalized health advice based on their location.	Medium	The solution should be able to run smoothly on most hardware.	High

The solution should provide weather forecasts to the user to inform health decisions.	High	The solution should be secure as it should be able to store health data.	High
The solution should have a dashboard for monitoring air quality data that the user can access.	High	The content in the solution should be responsive across devices such as phones, tablets and computers.	High
The solution should give the user advice on how to deal with health matters affected by the weather and environmental conditions.	High	The solution must follow relevant GDPR and copyright laws.	High
The solution should have a personal health tracking tool.	Medium	The solution should be scalable.	High
The solution should feature appropriate accessibility options.	High		

1.4 Decomposition of problems that need to be solved.

1.4.1 Functional Requirements

The solution should take the location of the user (Priority – High)

The solution should be able to take the location of the user to forecast their weather and analyze the environmental conditions. This is so that air quality can be monitored, and relevant alerts/weather warnings can be issued. This requirement has high priority as it is critical to the functionality of the solution and providing a personalized experience to the user. As well as this, the location of the user is needed to implement a potential feature suggested by the client – personalized health advice based on location.

How this could be done - This requirement could be achieved by basing the user location from the device that they are using the solution on.

The solution should provide weather forecasts to the user to inform health decisions (Priority – High)

The solution should be able to provide weather forecasts to the user to inform health decisions. This is so that the user can be aware of the condition of their surrounding environment in relation to any allergies they may have e.g., asthma, hay fever. This requirement has high priority as it is critical to the functionality of the solution, and it is a main requirement outlined by the client.

How this could be done - This requirement could be achieved by using an API that pulls appropriate weather data based on the user's location to be displayed in the solution. If the data suggests that environmental health conditions are bad e.g., high pollen count, the solution could send a push notification to the user.

The solution should have a dashboard for monitoring air quality data that the user can access (Priority – High)

The solution should have a dashboard for monitoring air quality data that the user can access. This is so that the user can make informed health decisions based off the air quality of their location or a location they are planning to travel to. This requirement has high priority as it is a main requirement that is outlined by the client.

How this could be done - This requirement could be achieved by using an API to pull relevant data based on the user's location to be displayed in the solution.

The solution should give the user personalized health advice based on their location (Priority – Medium)

The solution should be able to give the user personalized health advice based on their location. This is so that the user can act on any advice that is given to them based off their own health condition. This requirement has medium priority because it is a potential feature that the client has outlined, so the feature could be scrapped if needed to save time and resources.

How this could be done - This requirement could be achieved by pulling relevant data on environmental health conditions in the user's location. This data could be pulled from an API.

The solution should have a personal health tracking tool (Priority – Medium)

The solution should have a personal health tracking tool to allow for a personalized user experience. This requirement has medium priority as it is a potential feature outlined by the client and it is not critical to the functionality of the solution. This feature could be scrapped if needed to save development time and resources.

How this could be done - This requirement could be achieved by allowing the user to input and store relevant health information. This would need to use an encrypted database as users may input sensitive data – this is also needed to follow data protection laws. The data stored on the user could then be used as visual representations to track the user's health.

The content in the solution should feature appropriate accessibility options (Priority – High)

The content in the solution should feature appropriate accessibility options. This is so that the solution can be accessible and appeal to a range of user needs. This requirement has high priority because the solution should be accessible as possible.

How this could be done - This requirement could be achieved by allowing the solution to sync with any accessibility settings that are already being used on their device e.g., if they are using larger text size, high contrast mode etc. Alternatively, the solution could allow the user a range of options to adapt to their needs in a settings menu.

SEE 1.5 ACCESSIBILITY FEATURES

1.4.2 Non-Functional Requirements

The solution be compatible with most devices e.g., phones, tablets and computers (Priority – High)

The solution should be compatible with most devices as Health Advice Group will want the app to be accessible to as many users as possible. This requirement has high priority as the solution could be very beneficial to the health and welfare of those who use it – due to the practical advice it will offer.

The solution should be able to run smoothly on most hardware (Priority – High)

The solution should be able to run smoothly on most hardware. This requirement has high priority as the performance of the solution is critical to the user experience. As well as this, the end user will be expecting a solution that can be accessed 24/7 and a solution that is reliable – not likely to crash on them.

How this could be done - This requirement could be achieved by removing unnecessary quality of life features. An example of this is unnecessary animations and interactivity e.g.,

hovering/tapping on text increases the text size. Removing features could help increase the performance of the solution across different devices as well as saving development time.

The solution should be secure as it should be able to store health data (Priority – High)

The solution should be secure as it should be able to store health data. The storage of the user's health data is needed so that the solution can provide personalized health advice and track the personal health of the user. This requirement has high priority as the Health Advice Group will want the solution to be lawful, due to the sensitive data that could be accessed unauthorizedly.

How this could be done - This requirement could be achieved by adding a layer of encryption to all health data that is stored by the solution.

The content in the solution should be responsive across devices such as phones, tablets and computers (Priority – High)

The content in the solution should be responsive across devices such as phones, tablets and computers. This is so that the solution can be viewed and accessed regardless of the device that the user is on. This requirement has high priority because Health Advice Group will want the solution to be able to be used across a range of different devices.

The solution must follow relevant GDPR and copyright laws (Priority – High)

The solution must follow relevant GDPR and copyright laws. This is so that Health Advice Group cannot be legally liable for content used in the solution or the data management of user health data.

How this could be done – This requirement could be achieved by using non-copyrighted images and using encryption to store any data taken from the user.

The solution should be scalable (Priority – High)

The solution should be scalable. This is so that the solution can still run smoothly even when there is a large capacity of users using it. This requirement has high priority as the Health Advice Group will want a solution that is robust and one that is always available to their users. As well as this, the end user will be expecting a solution they can use at any time to view their health data, seek advice etc.

1.5 Accessibility Features

Accessibility Feature	Description
Text Size Slider	The solution could have a text size option that allows the user to adjust the size of the content they see. This is so that people who are more visually impaired than others can benefit from the solution.
High Contrast Mode	The solution could have a high contrast mode for users who have trouble distinguishing between high contrast and low contrast colors.
Colorblind modes	The solution could have a range of colorblind modes e.g., deuteranopia, protanopia so that people who are colorblind can benefit from the solution.

1.6 Key Performance Indicators and User Acceptance Criteria

1.6.1 Key Performance Indicators

Key Performance Indicator	Description
User Experience	The user experience is a key performance indicator as this can affect user retention and satisfaction. Examples of user experience KPIs are the number of crashes, the time it takes to load the app and the app's performance. If users of the app are not using it for long or are not satisfied with the experience, they may potentially deter other users from using the app.
User Retention	User retention is a key performance indicator that tells you how many users come back to use the solution. This is a good indicator of if users think the solution is useful and whether

	they are satisfied with their experience using the solution.
Number of downloads	The number of downloads is a key performance indicator that tells you how many people have downloaded the solution for use. This is a good indicator of if people think the solution is appealing and whether it could be useful.
Number of concurrent users	The number of concurrent users on the solution is a key performance indicator as not only does it indicate how popular and how often the solution is used, but it can also be an indicator for how good the load handling of the solution is.

1.6.2 User Acceptance Criteria

User Acceptance Criteria	**Explanation**
The user should be able to input and save their health data to the solution.	The solution should give the user the option to enter relevant health data. An example of this data could be their condition, health records etc. This data would then be stored in a backend database.
The user should be able to view a weather map for their location or desired location.	The solution should ask the user for a location or take the user's location if permitted. This will then be fed to an API which could then make a weather map visualization to be displayed in the solution.
The user should be able to input a location to find weather forecasts for.	The solution should have a search bar that allows the user to enter a location of their choice to display weather forecasts for. As well as this, the user could allow the solution to use their location to display weather forecasts for. An API could pull relevant data for the location entered and display it in the solution.
The user should be able to access a dashboard for monitoring air quality data based off their location or chosen location.	The solution should have a search bar that allows the user to enter a location of their choice to display air quality data for. As well as this, the user could allow the solution to use their location to base the air quality data off. An API could pull relevant air quality data for

	the location entered and display it in the solution.
The user should be able to navigate to a settings menu where they can change display settings etc.	The solution should have a visible settings icon which brings the user to a menu that allows the user to use the solution's accessibility features.
The user should be able to receive push notifications for weather warnings, environmental conditions (high pollen count) etc.	The solution should give the user the option to enable notifications for weather warnings and environmental conditions. The notifications should be personalized to the user's location or chosen location.
The user should be able to read information/advice about weather warnings, environmental conditions etc.	Weather warnings and environmental conditions should be displayed in the header of the solution's display. Upon interaction, the user should be able to view information about them.

1.7 Description of the proposed solution

My proposed solution is to make a product that allows the user to input their location for weather/environmental condition tracking. The key features of the product will be that the user will be able to view a weather map and weather forecasts for their location or desired location, which can be searched for. As well as this, the product will inform the user of weather warnings and changes in environmental conditions (e.g., pollen count, air quality) for their chosen location. This will be done in the solution or using push notifications. Relevant information and advice will also be displayed to the user. I will make the solution as an application using C# and using various APIs that pull data such as weather maps, weather forecasts and air quality.

1.7.1 Optional Features

My proposed solution will have an optional feature of inputting health data. The product will use and store the user's health data e.g., the condition of the user in a database and use weather forecasting to inform health decisions. For example, if a person input their condition as having hay fever into the solution, the user would be alerted if the pollen count is too high in their area. As well as this, my proposed solution will have accessibility features such as changing text size, colorblind mode etc.

1.8 Rationale/Justification

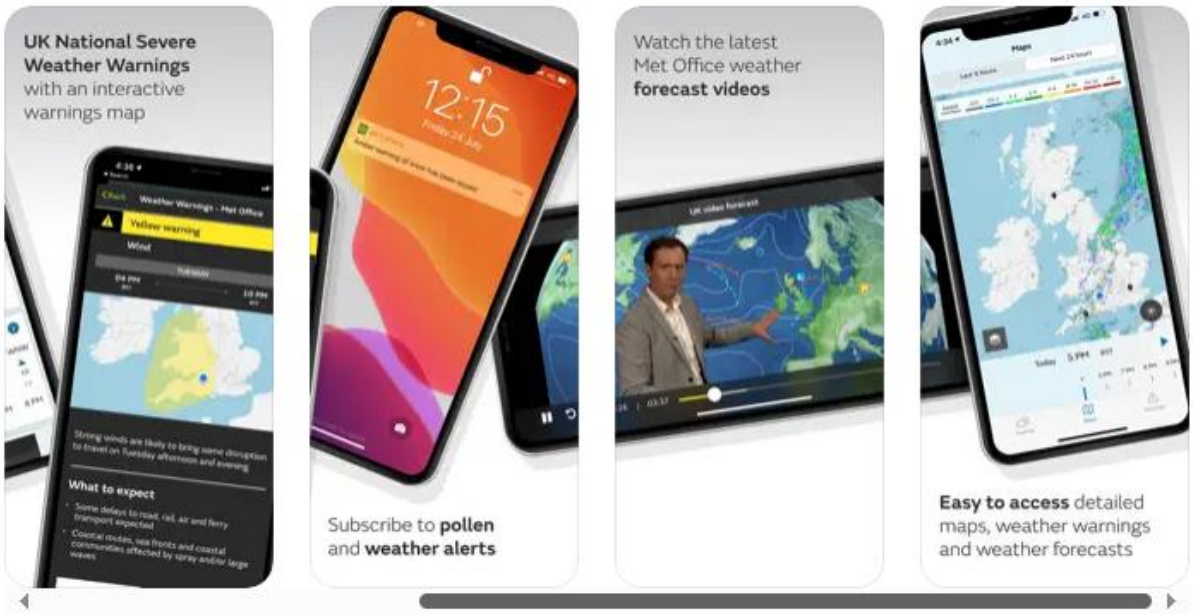
My proposed solution will meet the needs of the client as it will use weather forecasting as a means of informing health decisions to the user, monitor air quality in the user's location and give advice on how to deal with health matters that are affected by the weather and environmental conditions. My proposed solution will make use of APIs, such as a weather map API, weather data API and air quality API, to do this.

My proposed solution will meet the needs of the user as it will have accessibility features that appeal to a range of user needs e.g., colorblind mode for colorblind people, a text size slider for people who are visually impaired. It also meets the needs of the user as the product can give information on environmental health conditions and advice on how to deal with health matters related to the weather. For example, the product can inform a user with hay fever the pollen count of their location.

In terms of development, potential risks such as not meeting the deadline for the solution and not having enough money will be mitigated. This is because the development team will be told to complete features that have the highest priority and features that contribute to the functionality of the app first. If the development team struggles to create the whole product build by its deadline, quality of life features and features of lower priority could be scrapped to save time and resources. Finally, the budget assigned for the project will be closely monitored throughout the development phase to ensure that it does not go over budget. Some features of the product could be removed to save money and time. During development, care will also be taken in relation to GDPR and copyright laws. The development team will be told to use non-copyrighted images and content to put into the product and a layer of encryption will be put into the database that will store the user's health data – to ensure that data cannot be accessed unauthorizedly.

1.9 Appendix

Met Office Weather Forecast App



The Met Office Weather Forecast App gives accurate weather forecasts with coverage from one hour to seven days in advance. The key features of the app include quick switching between daily and hourly forecasts for your location or chosen location – the app can track your location. The app can provide the user with real-time UK National Severe Weather Warnings for your saved locations – these can be received through push notifications.

PERSONAL, ACCURATE FORECASTS INCLUDING: * Interactive UK rainfall map; both 24-hour forecast and 6 hour observations * Interactive UK National Severe Weather Warnings map * UK surface pressure map * Probability of precipitation (rain, sleet, snow, hail, & drizzle) * Actual and 'feels like' temperature * UK National Severe Weather Warnings alerts * UK national weather forecast video * Wind speed, direction and gusts * Sunrise & sunset times * Air pollution forecasts * Pollen push notifications (March to September) * Local weather forecasts unlimited locations * Ability to change your unit settings for temperature & wind speed * UV Index, visibility, humidity & pressure.

Main takeaways

- Allows you to view weather forecasts of your current location or chosen location.
- The app tracks your location to collect weather data.

- Provides real-time weather warnings for your saved locations. These can be received through push notifications.
- Provides pollen alerts for your saved locations.
- Friendly design, easy to understand and navigate.

Accessibility options

- You can navigate the app using a screen reader.
- You can view video weather forecasts with subtitles.

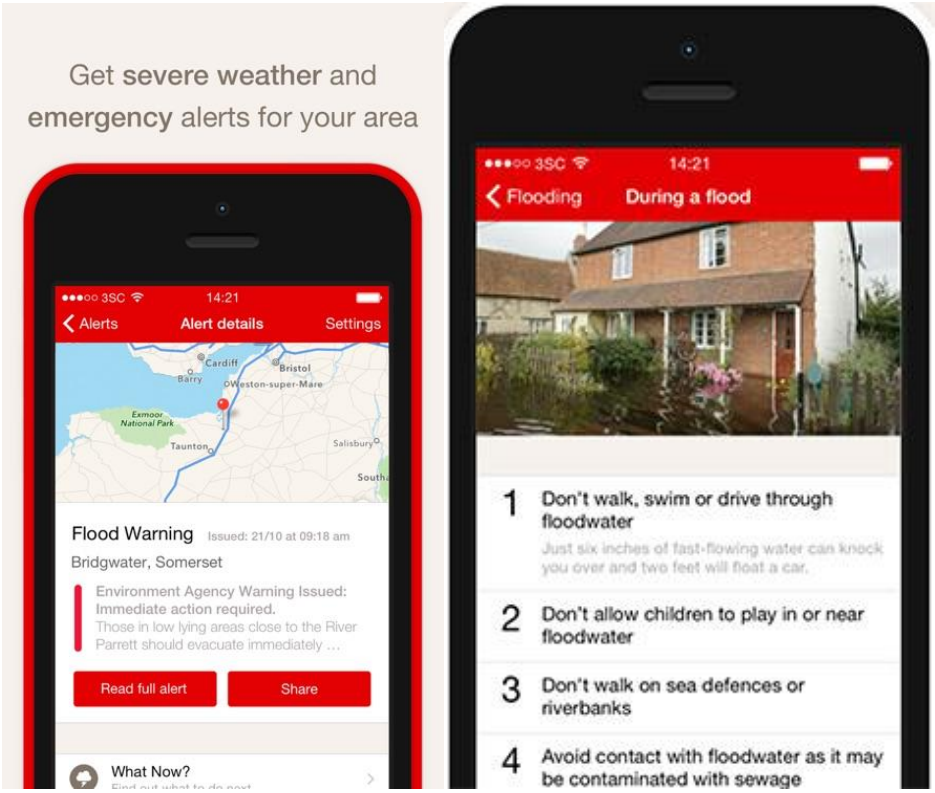
Pros

SEE MAIN TAKEAWAYS

Cons

- Exclusive to the UK
- has advertising.

British Red Cross Emergency App



The British Red Cross Emergency App checks your current location and sets up emergency alerts for your areas. These alerts include severe weather warnings. The app also provides a personal alarm and strobe light to the user, in order to attract attention in emergencies. The app also gives clear and practical advice on what to do in a variety of emergency situations. The app has a very simple design making it easy to navigate and understand for all users.

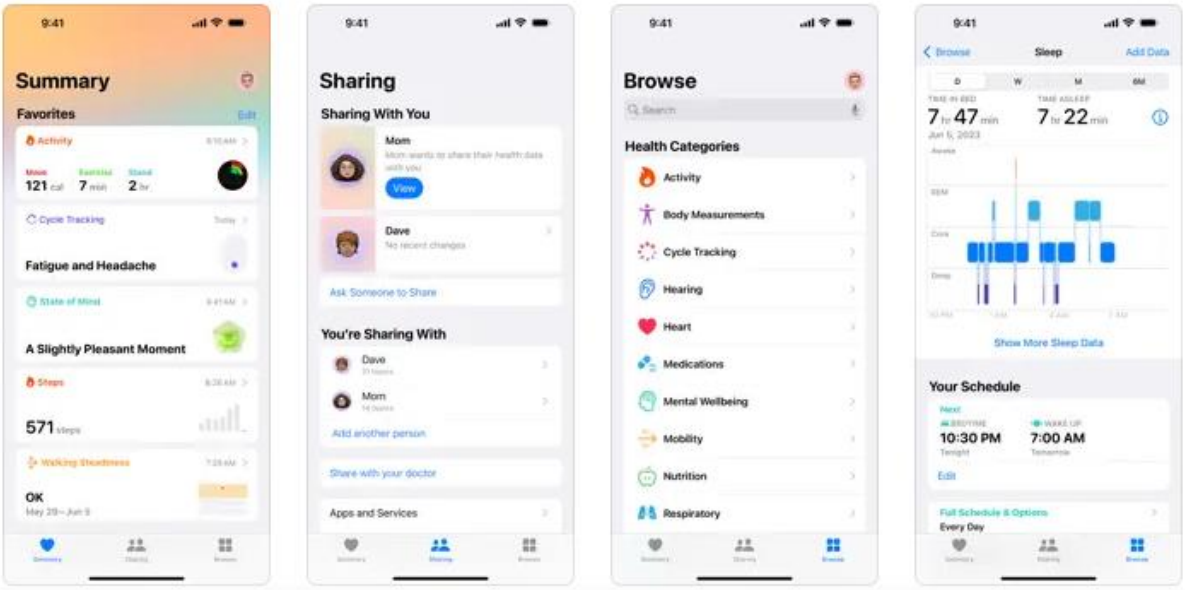
Main Takeaways

- Clean, simple design making the app easy to navigate.
- Checks your location and sets up emergency alerts for your area. Uses push notifications.
- Has a personal alarm.
- Provides clear and practical advice of what to do in a specific emergency.

Accessibility options

- Subtitles and transcripts to all video content.
- Can be navigated using screen readers.
- Alt text is provided for images.
- Colours have clear contrasts to make them easier to see.

Apple Health App



The Apple Health App provides a central and secure place for a user's health and fitness information. You can visualize and securely store health data from devices such as your iPhone, iPad and Apple Watch, as it is encrypted. You can browse interactive charts to review your health data over time, as well as receive steps, sleep and vitals highlights. The app also allows you to easily share your health data with people important to you.

Main Takeaways

- You can securely store your health data from supported devices, as the app encrypts it.
- You can view charts that show trends in your health from over time.
- Receive highlights on your steps, the amount of time you sleep and your vitals.
- You can easily share your health data with others.

Accessibility options

iPhone has built-in accessibility options. You can change the screen color and text size. You can also use screen readers, voiceovers etc.

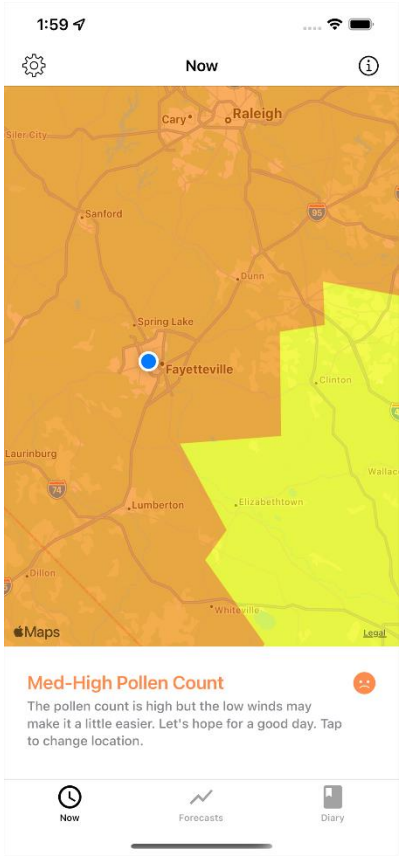
Pros

SEE MAIN TAKEAWAYS

Cons

- Only supported on Apple devices.
- Interface is quite cluttered making it harder to navigate the app.

My Pollen Forecast App



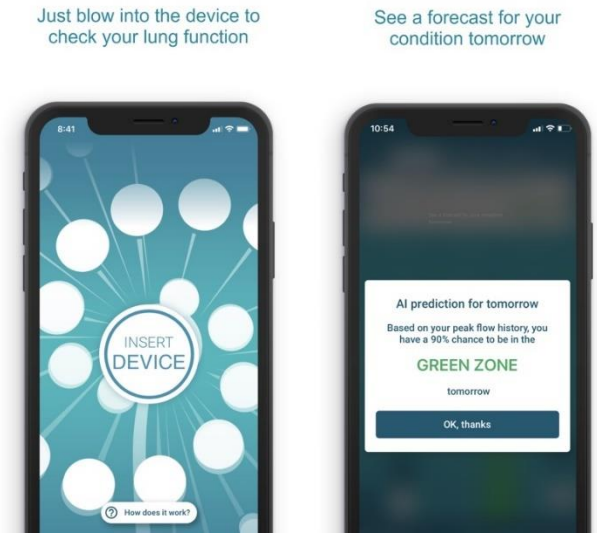
The My Pollen Forecast App is an app that allows the user to track the pollen count in their area, as well as their allergens. You can view hay fever forecasts two days in advance allowing the user to become more prepared for any allergy or asthma difficulties they could experience. The app

allows you to receive push notifications for when the pollen count is expected to be high, in your area. The app has a sleek, modern design which makes the app easily navigable and readable.

Main takeaways

- Checks the user's location to track the pollen count in their area.
- Sends push notifications to alert the user when the pollen count is expected to be high in their nearby area.
- Allows the user to view hay fever forecasts two days in advance.
- Sleek, modern design. The app is easy to navigate and read.

Smart Asthma: Forecast Asthma App



The Smart Asthma App provides the 'world's first' AI forecast that helps the user prepare and prevent asthma attacks. The app uses a system using Comp Ex events to detect if the user's inhalers are not working. The app also allows the user to conveniently share their asthma control data with a nurse or doctor. The app works best with the Smart Peak Flow device that measures your peak flow using light sensor technology and sends it to the app.

The app provides personalized reminders through push notifications to fit the user's lifestyle. The app tracks the user's condition using three color zones to tell the user if they are getting better or worse. Finally, there is also a built-in asthma action plan that tells the user what they need to do. The app has a simple design which is easy to understand.

Main Takeaways

- Uses AI to provide a forecast to the user to help them prepare and prevent asthma attacks.
- Detects if a user's inhaler is not working.
- Measures your peak flow if the app is used with a Smart Peak Flow device. This is then sent to the app.
- Allows the user to share their asthma control data to a doctor or nurse.
- Provides personalised reminders through push notifications. Also provides the user with a built-in asthma action plan.
- Tracks the user's condition.

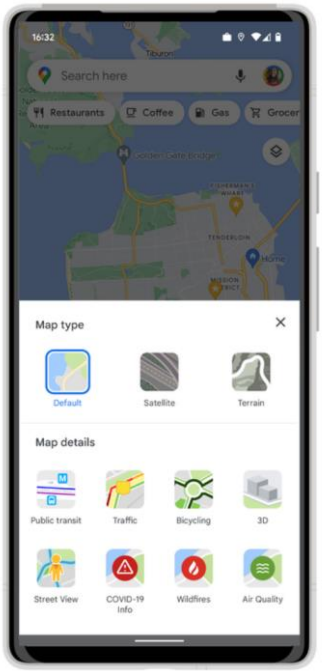
Pros

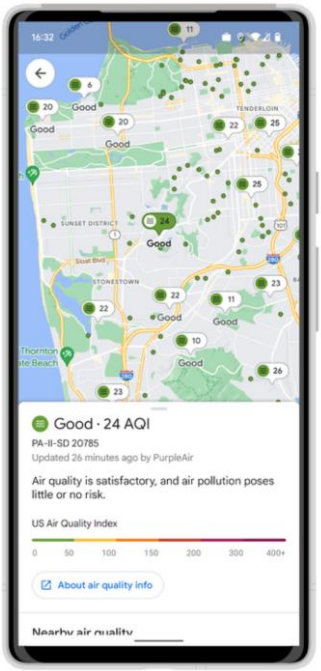
SEE MAIN TAKEAWAYS

Cons

The app works best with an external device that you would have to buy.

Google Maps Air Quality Tracking Tool





Google Maps has a dedicated tool to help users to check the air quality index for their area. The app does this by tracking the user's location. However, you can also track the air quality of places you want to visit to give the user an idea of their surroundings. The feature can easily be found within the app by pressing the layers button and tapping on the air quality icon under 'map details. The design of the app makes it easily navigable, and it is easy to understand as the content is very icon-based.

Main Takeaways

- Checks the air quality index for your area or a location of your choice.
- The app tracks the user's location.
- Friendly design, easily navigable using icons.

Accessibility options

- You can use a screen reader.
- You can use the app with your iPhone or Android's accessibility features.
- You can change text size.
- You can zoom into the map and move it.

Feature Table

Key

Green – Included

Red – Not included.

	Met Office Weather Forecast App	**British Red Cross Emergency App**	**Apple Health App**	**My Pollen Forecast App**	**Smart Asthma: Forecast Asthma App**	**Google Maps Air Quality Tracking Tool**

Advice on how to deal with extreme weather temperatures						
Information on environmental health conditions and seasonal allergies						
Weather forecasting to inform health decisions		Only for extreme weather.				
Access to a dashboard for monitoring air quality data						
Advice on how to deal with health matters affected by weather and environmental conditions						
Personalized health advice based on location						
Accessibility features that support a wide range of user needs.						
A personal health tracking tool.						