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# Research

## Introduction

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## How hardware and software are currently used

### Hardware

Currently, hardware is used to provide information and assistance to people via websites and mobile apps. Computers, laptops, smartphones, and tablet devices are the most widely used pieces of hardware in the sector. Individuals can access environmental health resources and information using any of these devices at any time and from any location.  
  
Other IOT devices that can be used to measure environmental conditions and provide users with real-time data include pollen counters, temperature sensors, and air quality monitors. This information can then be used to warn people about potential health risks in advance and provide guidance on how to reduce them.

Wearable watches and monitors, which essentially perform the same functions as the devices but are worn on the wrist, are another piece of hardware that is currently in use. This is advantageous because they are always able to keep an eye on the environment around you.

### Software

The use of software in the environmental health industry is super important for providing individuals with access to accurate and up-to-date information and support. As technology continues to evolve, the development and deployment of innovative software solutions will play a big role in improving the quality and accessibility of environmental health services.

Websites and mobile apps are the most common solution used in the current industry, as this allows to provide information and support to individuals

Ai and chatbots are also a key piece of technology that helps identify issues stemming from environmental health, Ai and chatbots can be integrated into websites and mobile happens to provide users with personalized recommendations and answers to frequently asked questions

Another software would be any generic environmental monitoring software. This type of software is used to collect data from environmental sensors and provide real time information to individuals about potential health risks

The last software component would be data analysis and visualization tools, which enable us to analyse and visualize massive amounts of data to spot patterns and trends more quickly than a human can.

## Emerging technologies

### Digital Inhalers

A new emerging technology are to help combat asthma, a “digital inhaler” has been developed to monitor and assist with asthma management. Devices that automatically log their use could create an opportunity to design decision algorithms that can act on accurate use information in real time.

### E-Diaries

Diaries are an emerging technology where patients can keep track of their physiologic status and improve the accuracy of the information by reducing errors that occur when recall is relied on. E-diaries can also be integrated with monitoring devices to permit tracking of more complicated information.

### Remote Patient Monitoring

Remote Patient Monitoring (RPM) is an emerging technology that involves gathering patient data outside of traditional healthcare settings for transmission to a remote location for monitoring by healthcare professionals. RPM devices and apps can directly report objective information and overcome distortions introduced by patient bias. However, there are few studies on their effectiveness, no consistent measures of device quality, and consumer devices and apps are not regulated by the FDA.

Like what was mentioned in hardware, Wearable devices can provide patients with personal health information and can be used to monitor physical activity. By combining wearable devices with e-diaries, the bias in self-reported physical activity can be reduced.

## How digital solutions could be used to meet different user needs

Environmental health issues can range from air pollution to water contamination, and many others. Digital solutions have the potential to greatly improve the monitoring and management of these issues, as well as empower individuals to take control of their own environmental health. Here are some examples of digital solutions.

### Health tracking and prevention

Digital solutions can also be used to track people's exposure to environmental health hazards. For example, you can develop a smartphone app that uses GPS and air quality data to alert users when they are in areas with high air pollution. Additionally, wearable devices can be used to track people's exposure to allergens and provide recommendations on how to avoid exposure.

### Education and outreach

Digital solutions can be used to educate the public about environmental health issues and how to protect themselves. For example, educational websites and mobile apps can be developed to provide information about different types of environmental health hazards, their symptoms, and ways to reduce exposure. This information can be accessed and understood by people of all ages and backgrounds, including those with literacy difficulties.

### Commitment to the community

Digital solutions can also be used to engage communities on environmental health issues. For example, social media platforms can be used to encourage individuals to share their experiences and connect with others facing similar challenges. Additionally, you can set up an online forum where individuals can discuss environmental health issues and share resources and support.

## industry-specific guidelines and regulations

As a software development company, there are some guidelines that we need to follow.

A health advice group would deal with sensitive and personal information and data, so we would need to ensure that we comply with the relevant data protection laws such as the [General Data Protection Regulation](https://gdpr-info.eu) (GDPR) and the [Health Insurance Portability and Accountability Act](https://www.cdc.gov/phlp/publications/topic/hipaa.html) (HIPAA).   
  
When making the proposed solution, we should ensure that our solution is up in quality by complying with relevant industry standards such as [ISO/IEC 12207](https://www.iso.org/standard/43447.html) and [ISO/IEC 15504](https://en.wikipedia.org/wiki/ISO/IEC_15504).

We would also need to ensure we follow an accessibility guideline, so that our digital solution is accessible with disabilities, The general guideline we should follow is the “[Web Content Accessibility Guidelines (WCAG) 2.1](https://www.w3.org/TR/WCAG21/).”

We should also make sure that the information provided by the digital solution is accurate, relevant and up to date in accordance with relevant environmental health regulations and guidelines

## Sources

[Current Hardware] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6384540/>

[Ai Software] <https://www.digitalhealth.net/2022/06/manchester-pilots-ai-software-for-adult-asthma-patients/>

[Software] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8420996/>

[Emerging Technologies] <https://www.jacionline.org/article/S0091-6749(19)32611-9/fulltext>

# Proposal

## Introduction

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## Existing and potential customers

### Existing customers

The existing customers of the Health Advice Group are individuals and families who are concerned about the impact of environmental health conditions on their health and well-being. They seek advice and support on how to manage and reduce the risks posed by these conditions, such as extreme temperatures, air pollution, and seasonal allergies. These customers may have specific needs and requirements, such as accessibility support or personal health tracking tools, which the digital solution should aim to meet.

### Potential customers

The potential customers of the Health Advice Group are individuals and families who may not yet be aware of the services and support offered by the charity. The digital solution has the potential to reach a wider audience by providing a convenient and accessible way to access health advice and support. These potential customers may include individuals who are at higher risk of environmental health conditions, such as those with pre-existing health conditions, older adults, and children.

### Summary

It is important to understand both existing and potential customers to ensure that the digital solution meets their needs and provides value. This may involve conducting user research and usability testing, gathering customer feedback, and analysing customer data to gain insights into their needs and preferences.

In summary, the existing and potential customers of the Health Advice Group represent a diverse and important target audience for the digital solution. By understanding their needs and requirements, the solution can be designed and developed to provide value and support to as many people as possible.

YOU DON’T USUALLY NEED THESE POINTS SINCE THEY ARE COVERED IN THE INTRO AND THIS SOUNDS LIKE WAFFLING, CAN DELETE IF U WANT

## Business Context

### Market position

The Health Advice Group is a charity that provides information and support on environmental health issues. The digital solution that the company develops will need to be positioned in the market to meet the needs of its target audience and to stand out from competing solutions. This may involve conducting market research and analysis to understand the competitive landscape and to identify opportunities for differentiation.

### Business Goals

The business goals for this organisation is to provide reliable and accessible information and support to individuals and families impacted by environmental health conditions. The digital solution will need to align with these goals, providing a convenient and effective way for users to access the information and support they need. The solution should also aim to generate revenue for the charity, through means such as advertising or premium services.

### Resource Constraints

As a charity, the Health Advice Group may have limited resources available for the development of the digital solution. This means that the solution will need to be developed efficiently and cost-effectively, while still meeting the needs of the client and the users. The solution should also be designed to be scalable, allowing for future growth and expansion.

### Summary

In summary, the business context provides the framework for developing a digital solution that meets the needs of the client and the users, while also aligning with the goals and constraints of the Health Advice Group. By understanding the market position, business goals, resource constraints, and legal and regulatory requirements, the solution can be designed and developed to provide maximum value and impact.

YOU DON’T USUALLY NEED THESE POINTS SINCE THEY ARE COVERED IN THE INTRO AND THIS SOUNDS LIKE WAFFLING, CAN DELETE IF U WANT

## User Stories

### Users of Solution

|  |  |  |  |
| --- | --- | --- | --- |
| User | Task | Goal | User acceptance criteria |
| Weather Forecasting User | View the current weather forecast | Stay informed about the weather condition and make informed health conditions | The weather forecast should be displayed accurately and be updated regularly, it should also be accessible from any device |
| Air Quality Monitoring User | View the current air quality index | Stay informed about the local air quality conditions and make informed health decisions | The air quality index should be displayed accurately and be updated regularly, it should also be accessible from any device |
| Health Advice User | Receive personalized health advice | Get relevant and accurate information about how to deal with health issues related to weather and environmental conditions | The personalized health advice should be based on the user's location and consider any relevant weather and air quality conditions. The advice should also be easy to understand and accessible from any device. |
| Health Tracking User | Track their personal health information | Stay informed about their health and identify any patterns or trends over time | The personal health tracking tool should allow users to easily input and view their health information, such as symptoms, medication, and exercise. The tool should also provide insights and visualization of the data. |

### Employee of Solution

|  |  |  |  |
| --- | --- | --- | --- |
| User | Task | Goal | User acceptance criteria |
| Admin | Manage user accounts | Ensure that users have access to the correct information and features based on their role | The admin should be able to create, edit, and delete user accounts, as well as assign roles to users (e.g. weather forecasting user, health advice user). The admin should also be able to view and manage user data, such as their location and health information. |
| Content Manager | Update and maintain health advice content | Ensure that the health advice content is accurate, relevant, and up-to-date | The content manager should be able to create, edit, and delete health advice content, as well as categorize it based on location and health issue. The content manager should also be able to review and approve content updates submitted by other employees. |
| Data Analyst | Analyse user data |  | The data analyst should be able to access and analyse user data, such as weather forecasts, air quality index, and personal health information. The data analyst should also be able to create visualizations and reports of the data, as well as identify patterns and trends. |

### Owner of Solution

|  |  |  |  |
| --- | --- | --- | --- |
| User | Task | Goal | User acceptance criteria |
| Health Advice Group Owner | Monitor the performance of the digital solution | Ensure that the digital solution is effectively supporting the mission and goals of the Health Advice Group | The owner should be able to access real-time performance data and analytics |
|  |  |  | The owner should be able to access usage metrics, such as the number of users, average time spent on the solution, etc. |
|  |  |  | The owner should be able to access KPIs related to the success of the solution |
|  |  |  | The owner should be able to review and assess the impact of the solution on the Health Advice Group and its mission |
|  |  |  | The owner should be able to make informed decisions about the future development and deployment of the solution |

MOST LIKELY DELETE THE EXTRA CELLS IN THE USER STORY BCUZ TO ME IT LOOKS UNFINISHED AND JUST ADD THE CRITERIA IN USER ACCEPTANCE CRITERIA HEADING

## Empathy Map

### User

Thinks:

* I want to stay healthy and avoid health problems caused by the environment
* I need access to accurate and up-to-date information about the environment and how it affects my health
* I want to be able to make informed decisions about my health based on the information available
* I want a solution that is easy and accessible

Feels:

* Concerned about the impact of the environment on their health
* Frustrated with limited access to information about environmental health
* Overwhelmed by the complexity of the information available
* Empowered and in control when they have access to accurate and easy-to-use information

Does:

* Searches for information about environmental health
* Makes decisions about their health based on the information they find
* Monitors their health and the environment to stay informed

Says:

* “I need to know more about the impact of the environment on my health”
* “I can’t find the information I need!”
* “This information is too complex; I need something simpler”
* “This is exactly what I was looking for, I can make informed decisions now”

### Employees

Thinks:

* I want to be able to provide the best advice to our users
* I want to be able to monitor and track user information

Feels:

* Pressure to provide accurate and up-to-date advice to clients
* Overwhelmed by the complexity of the information available
* Frustrated with limit access to information about environmental health
* Empowered and in control when they have access to accurate and easy-to-use information

Does:

* Searches for information about environmental health
* Provides advice to clients based on the information that they find
* Monitors client information and updates their records

Says:

* “I need to be able to access information about environmental health quickly and easily”
* “I want to provide the best advice to our clients”
* “This information is too complex; I need something similar”
* “This solution makes my job so much easier, I can provide better advice now”

### Employer

Thinks:

* I need to ensure that Health Advice Group continues to provide accurate and relevant information about environmental health to our clients
* I want to find ways to improve the support and services that we offer to our clients
* I need to be able to access up to date information about environmental health conditions and weather patters
* I need to be able to track our user’s health information and provide personalized health advice based on their location and health conditions

Feels:

* Responsible for ensuring that health advice group continues to provide valuable support and information to clients
* Confident that health advice group can provide the best support to users with the right tools and resources
* Frustrated by the limitations of existing tools and information sources
* Excited about the potential of a digital solution to improve the companies support and services

Does:

* Researches and evaluates potential solutions for health advice group
* Meets with stakeholders to understand their needs and requirements
* Makes decisions about which solutions to implement

Says:

* “I want to ensure that our company continues to provide valuable support and information to our users”
* “I need a solution that can help us track and monitor our user’s health information”
* “I believe that this solution will help us improve our support and services to our clients”

### 

## Functional Requirements

### Weather Forecasting

The digital solution should give users access to the most recent weather forecasts so they can decide what is best for their health and well-being. To deliver precise and pertinent weather data, this might entail integrating with a third-party weather API.

### Air Quality Dashboard

Users of the digital solution should have access to a dashboard that shows data on local pollution levels, UV index, and other pertinent metrics, as well as information on air quality. Users will be able to use this to keep an eye on the air quality in their neighbourhood and take the necessary precautions to lessen their exposure to pollution.

### Personalized Health Advice

The digital solution should offer users location-based, personalized health advice that considers the user's health profile, weather, and air quality. To deliver more precise and pertinent advice, this may entail integrating with other data sources, such as the user's health records.

### Accessibility Features

The digital solution ought to be made accessible, supporting a variety of user requirements like screen readers, voice commands, and alternative input techniques. This will guarantee that the solution is available to and usable by the broadest audience possible.

### Personal Health Tracking

The digital solution should give users access to a personal health tracking tool that will enable them to track the effects of environmental factors on their wellbeing as well as track their health over time. This might entail adding attributes like symptom tracking, health journals, and analytics.

### Summary

These functional requirements represent the digital solution's core features and functionality. The Health Advice Group can provide users with a convenient and effective way to access information and support on environmental health issues by incorporating these requirements into the solution's design and development.

In summary, the functional requirements list all the key features and functionality that should be included in the digital solution. Focusing on these requirements allows the solution to be designed and developed to meet the needs of the client and users while providing maximum value and impact.

THESE POINTS ARE JUST NAMING FEATURES, ADD DIFFERENT POINTS IN DETAIL SUCH AS E.G THE LOGIN SHOULD ALLOW THE USER TO LOGIN WITH THEIR DETAILS, THE ACCESSIBILITY WILL ALLOW USERS TO SELECT FEATURES.

## Non-Functional Requirements

### User Experience

A focus on user experience is critical for the success of the solution. This requirement involves designing and implementing an interface that is easy to use, intuitive, and accessible to a wide range of users. The solution should incorporate features that make it easy for users to access and understand the information they need, such as clear and concise navigation, informative graphics, and simple and straightforward language.

### Scalability

The solution must be expandable to meet user demand and projected growth. In order to meet this requirement, the solution must be created with scalability in mind, incorporating technology and design decisions that will enable it to expand and change over time. This might entail scalable architecture, modular design, and cloud-based infrastructure.

### Security

The solution must guarantee user data security and privacy. In order to safeguard sensitive information and stop unauthorized access, this requirement entails putting in place a variety of security measures, including encryption, user authentication, and data backup. Additional components of the solution, such as recurring security audits and threat assessments, should be used for monitoring and responding to security incidents.

### Reliability

The solution must have a high degree of availability and deliver reliable performance. This requirement calls for including safeguards like disaster recovery and redundancy measures to guarantee that the solution is always reachable and available when required. Additionally, the solution ought to be built to deliver dependable performance with little variation in response times and downtime.

### Compliance

The solution must adhere to pertinent legal and regulatory requirements in the health sector. To comprehend and address all pertinent guidelines and requirements, such as data protection laws and privacy regulations, this requirement necessitates consulting with pertinent regulatory bodies and legal experts. Mechanisms for observing and upholding compliance over time, like recurring audits and reviews, should also be part of the solution.

### Summary

In summary, the non-functional requirements are essential to ensuring that the digital solution is effective, user-friendly, secure, reliable, and compliant. They provide a framework for developing a solution that meets the needs of the client and the users and provides the foundation for a successful and sustainable solution.

THIS IS A BETTER REQUIREMENTS SECTION BUT STILL NEEDS WORK SUCH AS THE USER CAN LOGIN WITH EMAIL AND PASSWORD WHICH SHOULD BE ERROR CHECKED. JUST ADD A FEW MORE POINTS THATS ALL.

## Decomposition of Problems:

### PUT HIERARCHY DIAGRAM HERE, SEARCH RISK ASSESSMENT DIAGRAMS WITH PROBLEMS SUCH AS PROJECT MANAGEMENT, BUGS IN CODE, NOT ENOUGH RESOURCES.

### Integration with weather api

To provide users with accurate and relevant weather data, the digital solution must be integrated with a third-party weather API. This will necessitate careful consideration of the available data sources, API documentation and limitations, and methods for retrieving and processing the data in order to provide a user-friendly experience.

### Air Quality Data Management

To provide users with air quality data, the digital solution must be capable of collecting and managing air quality data from a variety of sources, such as local monitoring stations, satellite data, and other relevant sources. This will necessitate the development of robust data management processes and systems, as well as careful consideration of the implications for data privacy and security.

### Personalized Health Advice Engine

To provide users with personalized health advice, the digital solution must be able to integrate and process data from a variety of sources, such as the user's health records, weather data, air quality data, and other relevant information. This will necessitate the creation of a sophisticated and intelligent advice engine capable of processing complex data and providing users with tailored recommendations.

### Accessibility Features

The digital solution must be designed and developed with accessibility in mind in order to provide a user-friendly and accessible experience. Incorporating features such as screen readers, voice commands, and alternative input methods, as well as designing the user interface with accessibility guidelines in mind, may be necessary.

### Health Tracking Tools

The digital solution must be able to store and manage large amounts of health data, as well as provide user-friendly tools for tracking symptoms, monitoring health over time, and analysing health data, in order to provide users with a personal health tracking tool. This will require careful consideration of the implications for data privacy and security, as well as the development of robust data management systems and tools.

### Summary

These are the crucial challenges to be addressed in order to implement the digital solution's functional requirements. The solution can be developed in a structured and systematic way by breaking down the requirements into smaller, more manageable components, ensuring that all the necessary components are in place and working effectively.

In conclusion, problem decomposition provides a clear and detailed understanding of the key technical and operational challenges that must be overcome in order to deliver a successful digital solution. By carefully addressing these issues, a solution that meets the needs of the client and users can be developed and deployed.

BASED ON THE HIERARCHY DIAGRAM THAT YOU HAVE MADE AFTER, EXPLAIN THE LITTLE TOPICS ATTACHED TO EACH BRANCH SUCH AS WHY COULD WE HAVE A LACK OF RESOURCES. YOU SHOULD DO THESE TOPICS IN A SMALLER SHORT AND SWEET FORMAT AND PUT MANY PROBLEMS SUCH AS PAGE NOT LOADING, ACCESSIBILITY PANEL NOT SAVING FEATURES, THE SQL DATABASE NOT SAVING DATA FROM REGISTRATION AND WHAT CONSEQUENCES CAN IT BASICALLY LEAD INTO.

## Key Performance Indicators (KPIs):

### User Adoption

The number of users who have registered and are actively using the digital solution. This KPI will aid in determining how well the solution is meeting users' needs and how engaged the users are.

### User Satisfaction

A key performance indicator would be completing polls and surveys by the users. This will aid in gauging how well the solution meets user needs and how well the user experience is met.

### Health Improvement

The extent to which users are reporting improved health as a result of using the digital solution. This will help to measure the impact of the solution on users' health outcomes and the degree to which it is helping to address environmental health issues.

### Air Quality Data Accuracy

The precision of the data on air quality delivered by the digital solution, as evaluated against outside data sources. This KPI will aid in evaluating the accuracy and usefulness of the information the solution provides to users as well as the calibre of the air quality data.

REWRITE THIS BECAUSE NO, AIR QUALITY DATA CAN BE JUST BASED ON AN API RATHER THAN IF THE ACCURACY GRADUALLY GETS BETTER.

### User Retention

### The number of users who continue to use the digital solution over time. This KPI will help to measure the level of user engagement with the solution and the degree to which it is meeting their ongoing needs.

### Weather Forecasting Accuracy

The precision of the weather predictions offered by the digital solution, as evaluated against unbiased data sources. This KPI will aid in assessing both the accuracy and usefulness of the solution in providing users with accurate weather data.

SAME AS AIR QUALITY DATA ACCURACY BCUZ IT WONT BE MORE ACCURATE IF A COUPLE USERS JOINED THE SITE.

### Summary

The performance of the digital solution will be tracked over time using these KPIs, and any necessary adjustments will be made. By monitoring these KPIs, it will be possible to assess how well the solution has served the client's and users' needs overall, spot potential improvement areas, and implement any necessary adjustments.

In conclusion, the KPIs offer a distinct and measurable indicator of the success of the digital solution and will be used to assess its efficiency over time. It will be possible to check that the solution is producing the desired results and make any necessary adjustments to ensure its continued success by monitoring these KPIs.

## User Acceptance Criteria (UAC):

### Accessibility

A wide range of users, including those with disabilities, must be able to use the solution. Features like a high contrast mode, scalable fonts, and support for assistive technologies will be included.

### PersonalizatioN

Based on the user's location and health requirements, the solution must offer tailored health advice. Features like the capability to input one's own health information and get personalized recommendations based on that information will be part of this.

### User-Friendliness

The solution must have a user-friendly interface, clear and concise information, and be simple to use and navigate. Users will be able to find and access the information they need with ease thanks to features like simple navigation and a user-friendly interface.

### Reliability

The solution must be consistent and dependable with little technical difficulty or downtime. Features like consistent backups, failover systems, and secure data storage will be part of this.

### Relevance

In addition to advice on how to handle health issues impacted by weather and environmental conditions, the solution must offer pertinent and current information on seasonal allergies and environmental health conditions.

### Data Accuracy

The solution must deliver precise and trustworthy weather forecasts and information on the state of the air.

### Summary

These user acceptance criteria will be applied to the digital solution to ensure that it satisfies user needs and gives users the knowledge and assistance they require to manage their environmental health concerns. These requirements must be satisfied for the solution to be accepted by its users and achieve its objectives.

In conclusion, the user acceptance criteria offer a precise and quantifiable way to assess whether the digital solution has been successful in satisfying its users' needs. It will be possible to guarantee that the solution provides a high-quality user experience and satisfies the users' needs by making sure it complies with these requirements.

HOW ABOUT ADDING COLOUR THEMES, ERROR CHECKING, CLEAR INSTRUCTIONS, ROBUST SYSTEM, A RANGE OF ACCESSIBILITY FEATURES.

## Proposed Solution

### Tech Stack

Node.js will be used for the backend of the proposed solution for Health Advice Group, and Express will be used for the frontend. Node.js is a free, open-source, cross-platform runtime environment that offers high performance and scalability for server-side and networking applications. Express is a well-liked and adaptable Node.js framework that makes it easy to create web applications and manage HTTP requests and responses.

The solution will style itself using Bootstrap and Material UI. A popular open-source framework called Bootstrap offers a variety of pre-built components and styling options for creating responsive and mobile-first web applications. A React-based library called Material UI allows developers to create user interfaces in accordance with Google's Material Design principles, giving them a unified appearance and feel on all platforms and gadgets.

With an emphasis on performance, scalability, and accessibility, the combination of Node.js, Express, Bootstrap, and Material UI offers a reliable and adaptable solution for the digital platform for Health Advice Group. The solution will be able to satisfy both functional and non-functional requirements thanks to this technology stack, giving users a superior user experience.

A web-based application that offers users individualized health advice based on their location and health needs is the suggested solution for the digital platform for Health Advice Group.

### Features

#### Weather Forecasting

The solution will give users access to the most recent and accurate weather forecasts, enabling them to base their health decisions on the weather at the time.

#### Air Quality Dashboard

Users of the solution will have access to a dashboard that shows real-time air quality data, enabling them to keep track of the condition of the air in their neighbourhood and take the necessary precautions to safeguard their health.

#### Personalized Health Advice

Based on their location and health requirements, the solution will give users individualized health advice. Along with advice on how to handle health issues impacted by weather and environmental conditions, this will cover information on seasonal allergies and environmental health conditions.

#### Health Tracking Tool

A personal health tracking tool will be part of the solution, enabling users to monitor their health over time and get tailored recommendations based on their medical background.

#### Accessibility

With functions like a high contrast mode, scalable font sizes, and support for assistive technologies, the solution will be usable by a variety of users, including those with disabilities.

#### User-Friendliness

The solution will have a user-friendly interface, clear and concise information, and be simple to use and navigate.

#### Reliability

Regular backups, failover systems, and secure data storage will all be part of the solution, which will be consistent and dependable with little downtime and technical difficulties.

### Summary

In conclusion, the suggested solution will give users the knowledge and assistance they need to deal with their environmental health concerns. The solution will be available, simple to use, and trustworthy, giving users the knowledge, they need to make wise health decisions and monitor their health over time. The solution will be successful in achieving its objectives and offering a top-notch user experience by satisfying the functional and non-functional requirements.

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## Justifications

### Client and users

The recommended solution meets the needs of the client and the users by providing a comprehensive and user-friendly digital platform for accessing weather forecasts, air quality data, and personalized health advice based on location. The solution is designed to be accessible and support a wide range of user needs, with features such as personalized health advice and a personal health tracking tool.

The solution addresses the business context by providing a digital solution that offers a variety of features that are in high demand in the health sector, such as weather forecasting and air quality data. It also provides an opportunity for the Health Advice Group to expand its reach and offer its services to a wider audience, ultimately achieving its mission of providing information and support for environmental health issues.

In terms of functional requirements, the solution offers a comprehensive dashboard for monitoring air quality data and weather forecasts, as well as a personal health tracking tool and personalized health advice based on location. The solution is also designed to be highly accessible, with features such as personalized health advice and a personal health tracking tool, which are critical for meeting the needs of a wide range of users.

The decomposition of problems ensures that the solution is scalable and efficient, with a clear understanding of the tasks and processes required to implement the functional and non-functional requirements. This helps to mitigate potential risks and ensure that the solution is reliable and effective in meeting the needs of the client and users.

In terms of key performance indicators, the solution is designed to meet the needs of the client and users by providing accurate and up-to-date weather forecasts and air quality data, as well as personalized health advice based on location. User acceptance criteria are also included to ensure that the solution meets the needs of the users and that they are satisfied with the features and functionality offered.

### Potential risks and how they will be mitigated

Potential risks must be carefully considered and addressed if the suggested digital solution for Health Advice Group is to be successful. Risks can originate from a number of different places, including faulty technology, data breaches, or disgruntled users. The likelihood that the digital solution will satisfy the client's and users' needs will increase if these risks are proactively mitigated.

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PAGES NOT LOADING – BY TESTING THE RESPONSE TIME AND MAKING SURE IT WORKS CORRECTLY.

SQL DATABASE NOT SAVING INFORMATION – GIVE FEATURE SUCH AS REGISTRATION TO BE TESTED MULTIPLE TIMES BY END USERS.

#### Technological malfunctions

The likelihood of technological failures is decreased using dependable and well-established technologies like Node.js for the backend and Express.js for the frontend, as well as Material UI and Bootstrap for styling. In order to identify any problems early on, routine testing and quality assurance procedures will also be used.

#### Data Breaches

Both the client and the users are extremely concerned about data privacy. The digital solution will implement stringent access controls to sensitive data and use secure data transmission protocols like HTTPS to reduce the risk of data breaches. Additionally, the system will be routinely examined for security flaws, and all necessary steps will be taken to address any risks found.

#### User Dissatisfaction

The development process will adhere to user-centred design principles to reduce the possibility of user dissatisfaction. To make sure the digital solution satisfies user needs, user research, prototyping, and testing will be required. The digital solution will also include a feedback mechanism for users to report any problems they run into, and a customer support team will be on hand to help users as needed.

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#### summary

By proactively addressing these potential risks, the digital solution will have a greater chance of success and will be better able to meet the needs of the client and the users.

### Guidelines and legal requirements

Health sector regulations and laws must be complied with by the suggested digital solution for Health Advice Group. The following actions will be taken to guarantee that the solution complies with all applicable laws:

#### thorough research

I will do extensive research to understand the legal requirements and regulatory requirements that apply to software development in the health sector before I begin the development process. The solution will be developed using the information from this study, which will also guarantee that it complies with all legal requirements.

#### Data privacy and security

Data security and privacy will be given top priority during the design of the solution. To protect user data, this will entail putting in place secure data storage, transmission, and access controls. The solution will also adhere to all pertinent laws and regulations, including GDPR, HIPAA, and any others that may apply.

#### Accessibility

A wide range of users, including those with disabilities, will be able to use the solution thanks to its accessibility features. This will entail integrating accessibility tools like high-contrast mode, keyboard-only navigation, and alternative text for images. This will guarantee that the solution complies with laws like Section 508 of the Rehabilitation Act and the Web Content Accessibility Guidelines (WCAG).

#### User consent

#### Users' informed consent for the use of their data will be ensured by the solution's design. This will entail giving users control over their data and using clear, concise language during the consent process. This will guarantee that the solution complies with laws like the GDPR.

#### Ongoing compliance monitoring

The solution will be periodically checked by the project team to make sure it continues to adhere to all applicable laws. To ensure compliance, this will entail reviewing revised regulations, carrying out routine audits, and updating the solution as required.

#### Summary

These steps will ensure that the needs of the client and users are met, and the proposed solution will be designed and developed in accordance with all applicable regulatory guidelines and legal requirements in the health sector.