Task 1 – Proposal for Health Advice Group

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Solution Description

Based on the specifications set out by Health Advice Group for their desired solution, I believe that a web-based platform would be the most effective form that this digital solution could take. The website would offer multiple pages, all of which could be accessible from a single navigation bar for ease of use. It would be effective and handling the number of users that may have access to the solution, and its nature as a website would offer a number of advantages.

Why a website?

Firstly, a website allows end users access so long as they have an up-to-date web browser which most, if not all, devices will have pre-installed, and is therefore accessible always. Whilst an application could also suit this solution, separate versions would need to be developed in order to accommodate the different Operating Systems that devices like Computers, Phones and some Laptops run-on, which may be time consuming and would mean users must install the app on every device they intend to use. A web-based platform is instead very scalable, and so can be built to suit many devices under one coherent version. In addition, since this solution will be giving up-to-date and accurate information to its users, the appeal of developing an app for its offline capabilities does not fit, as users will need to have an internet connection to use these services. As a result, from a technical standpoint, a website is the most suitable option.

Secondly, websites have far stricter conventions when it comes to how they are designed. Their layouts are more rigid and follow simple rules that means when a user comes to access the site, they will not struggle with navigating through their options. This would mean that it could accommodate for a variety of user demographics by keeping to these design rules, whilst still allowing for personality and flexibility surrounding how the website will look and feel. An app has more room to be unique, however could be difficult to manage for those who are not used to using technology as there are less clear conventions and rules with how an app must be designed.

<u>Solution Detailed</u>

The planned solution will break down the key features and elements that Health Advice Group are looking for into four individual pages. Each page will focus around a specific element to help group relevant features together, so that the website is more intuitive and therefore easier to navigate.

Home Page – This page will be the welcome page for all users, with space for Health Advice Group to explain what they do, how the website operates/the features within it, and other important information. This page will be brief, but is the starting point that allows users to reach all other pages.

Location Page – This page will showcase all of the location-based features that Health Advice Group provide. It will allow users to choose their nearest location from a set of options, and will show the air quality, pollen count and temperature. In addition, there will be links to external weather sources which can also provide users with more up-to-date or specific information.

Advice Page – This page will act as a hub for information, where users can visit to understand the context behind the information presented to them on the location page. It will feature links to health sources about the effects of the weather on health, as well as articles from the website itself that showcase the advice that Health Advice Group offers. It will also show sources form other health bodies like the NHS and DEFRA, detailing specific health risks associated with the weather and how certain information is measured.

Account Page – This page and its subpages will allow users to login and then view their account specific data. They will be able to view their account info and edit it, adjust relevant accessibility features and track health progress, in this case through features like a BMI calculator. Other elements could be added in the future to improve this feature.

The solution will be written in a combination of HTML, CSS, JavaScript and SQL (potentially also including some PHP elements). HTML and CSS are the structural and styling languages, whilst JavaScript and PHP will be used for the programming and logic elements of the website, and also to connect to an SQL database. SQL will be the language used to create the database elements for the website.

<u>Conclusion</u>

In conclusion, this solution would be able to offer all of the features that Health Advice Group are interested in displaying in a clear and simple design that would take the form of a website. This proposed solution would separate each feature into clear pages that would make the solution easy to navigate, along with a consideration of key accessibility options for users to alter the website's design to best suit them.

Business Context

Health Advice Group will see a number of benefits by choosing to introduce a digital solution to new and existing users. Firstly, the health sector is widely adopting more software to greatly improve the

efficiency and availability of certain features. By choosing to create a solution of their own, Health Advice Group are bringing themselves in line and up-to-date with competitors and businesses who are offering similar services and also make use of digital options.

For example, Health Advice Group's interest in developing a personal health tracking tool is not dissimilar from existing applications and businesses, such as the rise in popularity of smart-devices that can monitor health information like Fitbit and Apple smart watches. Health Advice Group will meet the expectations of the market which expects this kind of technology and greatly improve their standing and notoriety as a business amongst similar organisations.

Secondly, by implementing this solution Health Advice Group will see an increase in their users/clients. This solution will be widely available and therefore will have a greater reach – allowing Health Advice Group to regain the interest of their existing users and open their operations up to a greater range of users who will be able to visit the website and recognise the features that Health Advice Group can offer them.

Functional and Non-Functional Requirements

In this section, the functional and non-functional requirements of this solution are identified and justified. The functional requirements are the minimum necessary elements for the solution to achieve what Health Advice Group are asking for, and the non-functional requirements are additional elements that are still important, but do not effect the way the solution operates.

Functional Requirements	Non-functional Requirements

1. Weather forecasting
    - Cold weather/weather elements involved
    - Allergens, Asthma warning, Hay fever warnings
    - Embedded information
2. Air quality data
    - Pollution information
    - Map/location
3. Advice on health matters
    - NHS info embed
4. Health Tracker
    - Inputs for exercise, diet info etc.
    - BMI Calculator
    - Account features.
5. Location data
    - Map shows nearest surgeries, hospitals and POIs
    - Shows relevant data for temperature, air quality etc.
	1. Security
	    - Password strength test
	    - Input validation
	    - 2FA and Email verification
	2. Accessibility
	    - Colour scheme adjuster
	    - Dark/Light mode
	    - Image alt text
	3. Scalability
	    - Fits for a variety of screen sizes.
	4. KPIs and Metrics
	    - Responsiveness
	    - Load handling
	5. User Acceptance Criteria

Expanding Functional Requirements

    1. Weather forecasting

Connecting to APIs or providing embedded elements for users to provide relevant information. Either embedded material within the website, or making use of external links to websites like the Met Office, BBC Weather and others to provide this information.

2. Air quality Data

Same as above, either providing this info as part of an API or redirect to a given website to display this information.

3. Advice on Health Matters

Dedicated page for this information, with info coming directly from Health Advice Group themselves. Linking to another website will not be necessary for the purposes of this feature.
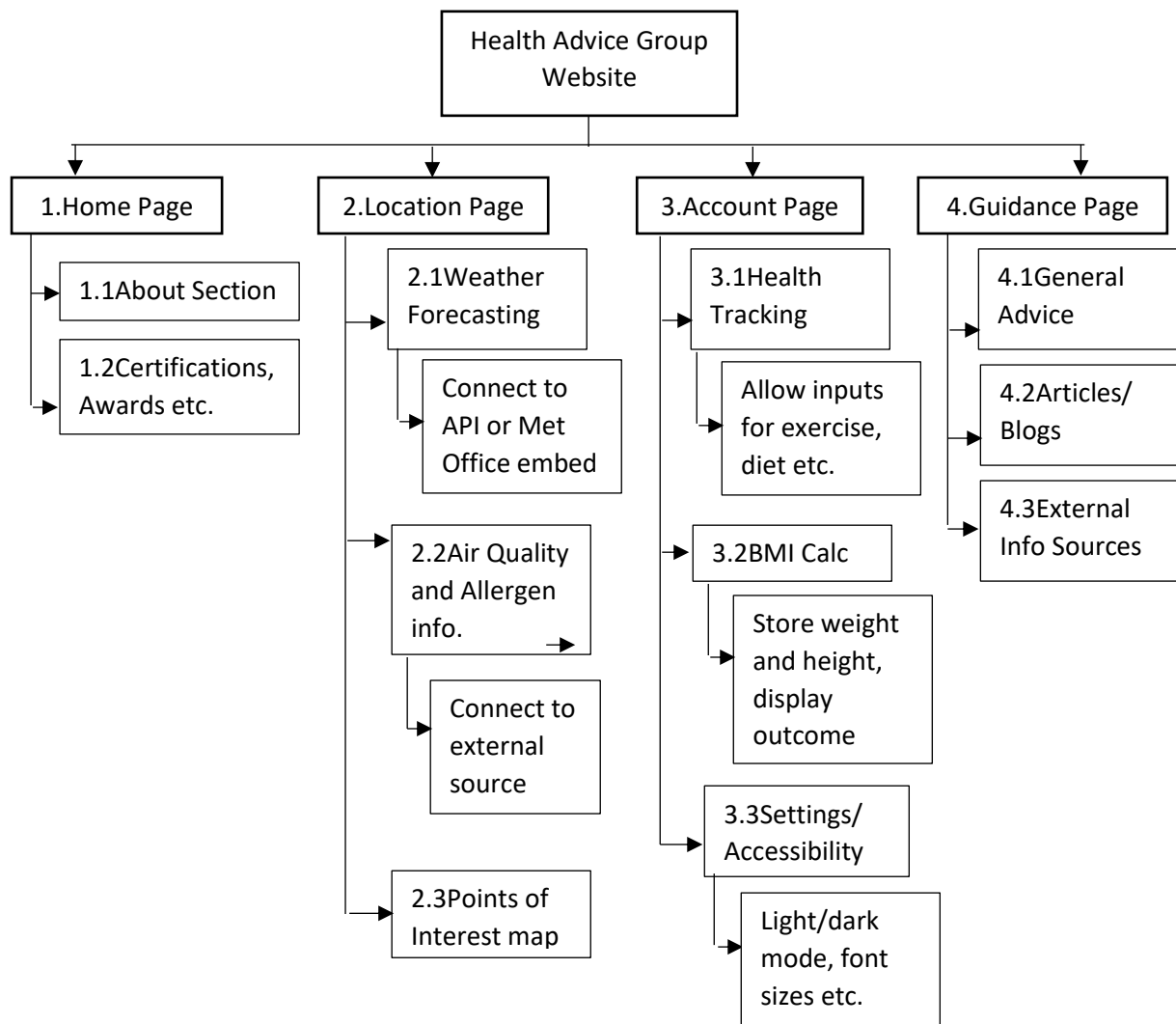
4. Health Tracker

These elements can fall under the 'Account' section of the website. Features may include an embedded BMI Calculator, and can store data from user inputs about personal activity, diet, etc.

5. Location Data

Making use of a map based on user information (such as an address) that will provide useful info such as the location of nearby hospitals, leisure centres, gyms, pharmacies etc.

Decomposition of Functional Requirements

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                        Health Advice Group
                              Website
        ┌─────────────────┬──────────────┴──────────────┬─────────────────┐
        ▼                 ▼                              ▼                 ▼
  1.Home Page        2.Location Page              3.Account Page      4.Guidance Page
        │                 │                              │                 │
    ┌───┘             ┌───┘                          ┌───┘             ┌───┘
    ▼                 ▼                              ▼                 ▼
1.1About Section   2.1Weather                    3.1Health         4.1General
    │               Forecasting                   Tracking          Advice
    ▼                  │                             │
1.2Certifications,     ▼                             ▼             4.2Articles/
Awards etc.         Connect to                    Allow inputs      Blogs
                    API or Met                    for exercise,
                    Office embed                  diet etc.        4.3External
                       │                             │              Info Sources
                       ▼                             ▼
                    2.2Air Quality                3.2BMI Calc
                    and Allergen                     │
                    info.                            ▼
                       │                          Store weight
                       ▼                          and height,
                    Connect to                    display
                    external                      outcome
                    source                           │
                       │                             ▼
                       ▼                          3.3Settings/
                    2.3Points of                  Accessibility
                    Interest map                     │
                                                     ▼
                                                  Light/dark
                                                  mode, font
                                                  sizes etc.
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Methodology

When developing this solution, an Agile approach shall be used as the intended methodology. This has a number of benefits, and is largely being selected due to the way development is organised. The use of sprints will be able to separate development into the key functional requirements, where each major feature is tackled separately before being integrated with one another as more are finalised.

By focusing on one element at a time, there will be greater clarity during development as any successful or failed processes can be evaluated at the end of each sprint. This feedback can then be used to inform how future sprints are carried out, with the intent of making development a more streamlined process. In addition, since the development team is small, there is not enough time to develop these features in tandem. Splitting them apart will help iron out bugs and issues faster, and mean that the correct amount of time and detail can be placed onto each important feature of the solution.

Legislation, Regulation and Risks

There are a number of concerns that will need to be evaluated when creating the solution along with ways to mitigate them, as well as regulations and guidelines that must inform elements of the development process.

Legislation

There are a number of Acts that will govern how data and information is handled:

- *Data Protection Act (2018) and General Data Protection and Regulation (GDPR, 2018)* – governs how data is collected and managed, including ensuring that:
    - Data is kept secure/safe (adhering to the integrity and confidentiality of data).
    - Purpose limitation (data can only be used for its described purposes, often in the form of Terms and Conditions).
    - Data Minimisation (only requesting data that is necessary for the functions of the solution).
    - Accuracy (keeping information up-to-date).
- *Freedom Of Information Act (2000)* – members of the public can request information held by public bodies. Information used for the purposes of this website must be made available upon request.

Regulations

The following regulations span a variety of disciplines, but are demonstrations of the types of considerations that must be made during the development process:

- *Patient/Doctor Confidentiality* – whilst not operating as a means of organising appointments, user information could refer to medical history that would normally be kept confidentially.
- *Demographic suitability* – considering the age ranges of potential users, and making sure that content on the site is suitable for potential groups (e.g. adult or mature content is kept from accounts that are below adult age).
- *W3C Regulations* – conventions regarding how a website must be developed, such as code organisation, such as Website Quality, Website Accessibility (including disabilities and stability considerations).

Risks

When handling user data and developing a solution based on the internet, there are various risks that must be properly assessed.

Security:

- *DoS and DDoS attacks* – these types of Denial of Service attacks can render a website completely inoperable – therefore, hardware and software used to support this solution must be tested to ensure it can handle stress/load against the anticipated number of average users.
- *Data Protection* – making sure that data is properly secured at all stages, particularly in transit (when transferred between devices) and in use (when it is being accessed). This may include use of secure protocols like HTTPS to protect against man-in-the-middle attacks, and encryption to make sure information is protected if there is a data breach.
- *SQL Injection* – making sure that the website databases will not dump data if an attacker gains access. Simple procedures such as validating inputs and customising error messages so that the database structure is not recognisable.
- *Training* – any individuals who are likely to interact with this data should be educated on practices and actions necessary to keep this data safe.

KPIs and User Acceptance Criteria

KPIs and Metrics

Once the digital solution is completed and goes live, there are some elements that can inform how well the site is succeeding and provide useful user data that can give an insight into how the solution is being received.

1. Number of user sign-ups after a month

A simple away of measuring success, taking data from the number of people who have signed up to the site is a very easy process. It provides valuable data about the traffic that the site is experiencing, and can be used to compare the activity of their services both before and after the site is made active. This will give the most clear indication of whether there has been a substantial increase in the number of new users.

2. Session duration and activity

 Monitoring the activity throughout the site is also a crucial way of identifying what specific features are seeing activity. By monitoring session duration, this can give greater insight into how frequently users are interacting with the site. In addition, it can highlight how specific services are performing which in turn will allow these features to be evaluated – e.g. how easy are they to use, what do they offer to a user etc.

3. Traffic by Source

Another key way of breaking down important traffic data is by measuring the sources that they come from. This could include whether they are discovering the site through advertisements, social media , etc, and allow marketing strategies to be adjusted. Knowing what types of marketing or advertising succeeds can help Health Advice Group make informed decisions and better understand their userbase.

User Acceptance Criteria

When producing the solution, it will also be important to keep in mind the expectations that end users will have for its functionality. A combination of user stories and sample expectations work as an effective way to checklist certain features against the standards that exist for normal user experiences when using a digital solution. The following general UX features should be considered:

- When a user logs into their account on one page of the website, they should remain logged in when visiting other pages.
- When a user makes changes/adjustments to the website through the settings features, these should remain in place when visiting other pages.
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User Story 1:

'I am a user who wants to create an account so that my information can be saved for future visits to the site.'

Criteria:

1. Visit Login Page
2. Press 'Sign-up' button
3. Redirect to register page
4. Input Email and password
5. Confirm password
6. Email verification sent
7. Once verified, redirect to login page
8. Login and navigate to account page

User Story 2:

'I am a user who wants to adjust some display settings so that the website layout is easier for me to read and interact with'.

Criteria:

1. Visit settings page
2. Find accessibility settings
3. Click on 'dark mode' feature
4. Press 'submit' button to confirm changes
5. Page changes to dark mode format
6. Navigate back to previous page, where the dark mode persists

User Story 3:

'I am a user who wants to view the air pollen count of two locations so that I can decide if my allergies will be impacted when I travel'

Criteria:

1. Visit the location info page
2. Select my nearest city/region from options available
3. Pollen count and air pollution info updates on website
4. Change city for another area

5. Pollen count adjust dynamically

Appendix

List of relevant regulations, laws and standards relating to the use of data and information in this context.

Data Protection Act (2018) – Everyone responsible for using personal data has to follow strict rules, known as 'data protection principles'. They must make sure that information is:

- Used fairly, lawfully and transparently.
- Used for specified, explicit purposes.
- Used in a way that is adequate, relevant and limited to only what is necessary.
- Accurate and, where necessary, kept up to date.
- Kept for no longer than is necessary.
- Handled in a way that ensures appropriate security, including protection against unlawful or unauthorised processing, access, loss, destruction or damage.

There are stronger protection against more sensitive information, such as race, ethnicity, political opinions, religious belief, sex life or orientation, health, genetics etc.

Freedom of Information Act (2000) – Establishes a public 'right to access' in relation to information held by public authorities.

Doctor-patient confidentiality – set of principles that keeps certain information kept in private between a doctor/medical staff, and a given patient. It is a legal and ethical duty, that should be considered in this context based on the information that is being provided by users.

W3C Standards – standards that act as blueprints for website creation. They cover elements of accessibility, structure, and validation. These principles make sure that any website is developed with a set of parameters that generate a consensus around how websites are managed and designed.

Web Content Accessibility Guidelines (W3C Recommendation) – Covers a wide range of recommendations for making content accessible, relating to people with disabilities, accommodations for blindness and low vision, deafness and hearing loss, limited movement, photosensitivity, learning disabilities and cognitive limitations.