ECS522U Graphical User Interfaces

HikeCast - Hiking Weather App

Requirements and Design – Group 9

Contents

1. Overview of Hikers as Primary Stakeholders

Hikers represent a diverse and dynamic stakeholder group within the realm of outdoor recreation. Understanding their motivations, characteristics, requirements, preferences, limitations, and potential challenges is crucial for developing effective solutions and ensuring customer satisfaction.

Interest to Stakeholder Group

Hikers are a pivotal stakeholder group for our weather app development. Their active engagement in hiking underscores the importance of delivering accurate and timely weather information. Understanding their preferences and requirements ensures that our app becomes an indispensable companion for hikers, enhancing their adventures and above all, ensuring that they make safe, informed decisions.

Characteristics

Preference for Detailed Information: Hikers seek comprehensive weather information encompassing various factors such as precipitation probabilities, wind speeds, and visibility forecasts. Detailed forecasts enable hikers to anticipate and prepare for changing weather conditions during their journeys, enhancing their overall outdoor experience and safety.

Real-Time Updates and Interactivity: Hikers value real-time weather updates and interactive features that enable them to dynamically adjust their plans based on evolving weather conditions. Integration of features such as alerts for severe weather events enhances the app's utility for hikers.

Unique Requirements

Hikers possess unique requirements tailored to their outdoor adventures. Their needs are specifically crafted to enhance their preparedness for outdoor conditions. They seek features that provide insights into potential hazards such as thunderstorms, high winds, or extreme temperatures. The average age of hikers is **43.9** years old [1], so it is important that the app is easy to use even for those that may be less familiar with technology.

Functional Needs

- **Temperature:** Both current and forecasted temperatures are essential for hikers to plan their attire and gear accordingly.
- **Humidity:** Humidity levels influence perceived temperature and comfort, and the likelihood of precipitation. High humidity can make conditions feel hotter or colder than the actual temperature and can affect hikers' comfort levels and hydration needs.
- **Precipitation:** Knowing if precipitation is expected, its type (rain, snow, etc.), intensity, and duration helps hikers prepare appropriately.
- **Wind Speed and Direction:** Wind conditions can impact hikers' comfort, especially in exposed areas or at higher elevations. Strong winds may affect navigation, increase the risk of hypothermia, and influence fire danger.

- **UV Index:** Hikers spending extended periods outdoors need to be aware of UV exposure levels to protect themselves from sunburn and skin damage.
- **Sunrise and Sunset Times:** Knowing when the sun rises and sets helps hikers plan their activities and ensure they have adequate daylight for their journey.
- **Barometric Pressure:** Changes in barometric pressure can indicate approaching weather systems, such as storms or changes in atmospheric conditions, which may affect hiking conditions and potentially trigger altitude-related health issues.
- **Visibility:** Visibility levels are crucial for hikers navigating through fog, mist, or haze. Reduced visibility can impact safety and route finding, especially in mountainous or densely wooded areas.
- **Air quality:** Air quality is vital information to hikers to know about, especially for hikers with respiratory problems, it's crucial for hikers to monitor air quality to avoid health complications and navigate safely.

GUI Preferences

Hikers prefer a GUI that not only presents the basics like temperature and precipitation but also has detailed information such as wind speed, humidity levels, and UV index. The GUI should aim for a balance between modern aesthetics, as well as readability and ease of use. Font sizes should be large enough for comfortable reading, and color schemes should be chosen with consideration for visibility and legibility, especially for the outdoors.

Limitations

Hikers might face specific challenges or considerations that affect how they use a weather web app. For instance, they could encounter limited internet connectivity in remote hiking areas, making it hard to get real-time weather updates. The app needs to be flexible and responsive to cover the diverse needs and challenges that hikers encounter during their outdoor journeys.

Potential Challenges

Creating the weather web app for hikers may present several potential challenges. These challenges could include technical hurdles such as ensuring the app functions reliably in areas with limited internet connectivity and addressing accessibility concerns for users with visual impairments. Additionally, challenges related to usability and data accuracy underscore the importance of thorough planning, testing, and iterative development processes to create a robust and user-friendly app that meets the diverse needs of hikers during their outdoor adventures.

Other Aspects

Hikers are part of a wider outdoor enthusiast community, encompassing various activities such as backpacking, camping, trail running, and nature photography. Collaborating with outdoor enthusiasts, conservation groups, and local communities can foster partnerships, promote responsible outdoor practices, and enhance the overall outdoor experience.

2. Identification and Description of Wider Stakeholders

Secondary Stakeholders

- **Outdoor Gear Retailers**: Companies that sell hiking and outdoor gear may be affected by the app because it indirectly influences hikers' decisions on when and where to hike, which could as a result affect their need for outdoor equipment. They may consider aligning their marketing strategies and promotions with weather conditions favourable for hiking. We could partner with outdoor gear retailers to offer deals based on the predicted weather conditions. The retailers could also gain insights into hikers' preferences and behaviours through the app to better cater their marketing.

Tertiary Stakeholders

- **Environmentalists:** Environmentalists may be conducting research or conservation efforts in natural areas. The information from the app may be used in tracking the impact of weather conditions on local ecosystems and wildlife habitats. They may also use our weather app to track weather patterns and plan fieldwork accordingly.

- **Local Tourism Boards:** Tourism organisations promoting hiking destinations may be interested in the app's features and data. They could use the information to gain an understanding of which hiking trails are popular during specific weather conditions to allow them to tailor their marketing accordingly.

Facilitating Stakeholders

- **UX Designers and Researchers:** Our group will ensure the app meets user needs, optimising its interface for increased satisfaction and success.

- **Weather Data Providers:** Companies that provide the weather data used by our app would ensure accuracy and reliability of the weather forecast presented to users. They may have partnerships with app developers to supply real-time weather information and may also benefit from increased visibility and usage of their data through the app.

- **Technology Platform Providers:** Could include providing cloud computing services, app development frameworks, etc. Enables app to function effectively and scale to accommodate a large user base.

3. Data Gathering

Choice of Data Collection

We used questionnaires and researching similar products as data gathering techniques. A questionnaire is suitable for collecting quantitative and qualitative information about hiker's preferences which aids in deciding the features to implement in the application. Researching similar products is suitable because it provides insights into hiker's user experience with existing applications. This is useful because we can identify areas of improvement to help improve user experience for our application. Studying documentation was not a useful data gathering technique as it tells us the procedures implemented by the developers rather than what the hikers are looking for in a weather app.

The Results

We designed a questionnaire tailored towards hikers and shared it across multiple online platforms. Having collected the data, it becomes clear that most respondents have experience with hiking, with **41%** choosing to hike **4-6 times a month** and another **30%** choosing to hike **2-3 times a month**. Understanding the different levels of frequency at which people hike can help identify the different needs of hikers. For example, we will implement real-time weather updates for popular trails to make it easier for newer hikers to plan their outings.

When asked what factors influence the respondents, **34%** choose weather conditions. Since this is a primary concern for hikers, we will focus on providing accurate weather forecasts (e.g. temperature, wind speed, precipitation) to meet users' needs. By including such features, hikers will have access to reliable weather information which they can use to plan hikes, enhancing their hiking experience.

As part of the questionnaire, we also asked the respondents what weather conditions they take into consideration when they plan their hike. Trail conditions (**36%**), precipitation (**31%**) and temperature (**20%**) where the top three weather conditions that were taken into consideration by hikers. Using this information, we have decided to prioritise the addition of the three top conditions to our application. Once these have been added, we can focus on other conditions listed such as visibility, wind speed and UV index. By following these steps, we can streamline the implementation process while meeting hikers needs.

In the questionnaire, hikers identified **"Trail specific forecasts"** as the most useful feature in a hiking app. Providing details about a trail, such as elevation and terrain type, can help hikers plan their hikes more effectively. This is because they can plan their route better and make wiser choices about the gear they choose to wear. Within the app, we can display the elevation levels across the trail. The second most useful feature identified by hikers, with **33%**, is **"Alerts for severe weather"**. Having such alerts can help mitigate risks for hikers and keep the users of the app safe. As part of the app, we can send out notification alerts for severe weather such as floods.
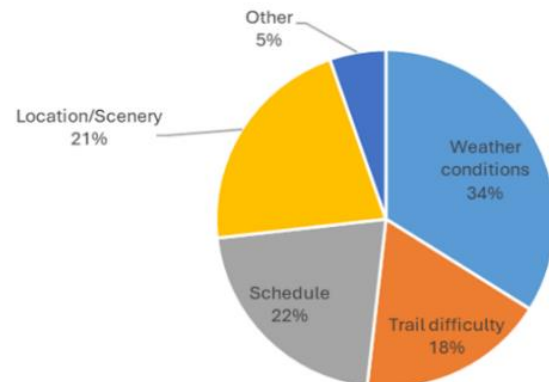
In the questionnaire, respondents were asked about the conditions they take into consideration when hiking. At the end of the questionnaire, we asked the hikers an open-ended question, encouraging them to suggest features they would like to see in the hiking app. **31%** of respondents included **"trail"** within their response. Upon examining the responses from the

question, we can identify that there is a need for hikers to know more about the current trail conditions. We have decided to implement a community comment feature where users of the app can give live updates of the conditions on the trails at specific points of the hike. This feature can help enhance safety as well as provide a sense of community and encourage engagement.
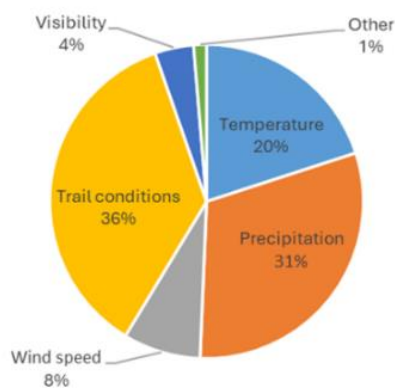
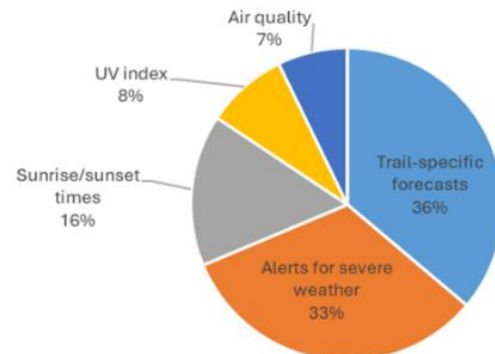### How many times a month do you go hiking?

- Never 4%
- Once a month 7%
- Rarely 7%
- 7+ times a month 11%
- 2-3 times a month 30%
- 4-6 times a month 41%
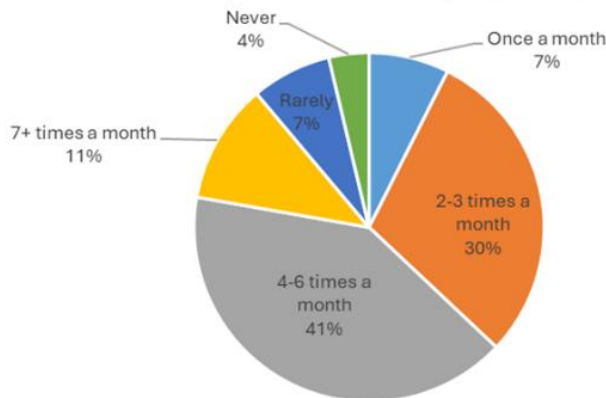
What factors influence your decision to go hiking?

- Other 5%
- Location/Scenery 21%
- Weather conditions 34%
- Schedule 22%
- Trail difficulty 18%

What weather conditions do you take into consideration when you plan your hike?

- Visibility 4%
- Other 1%
- Temperature 20%
- Trail conditions 36%
- Precipitation 31%
- Wind speed 8%

What features would you find most useful in a hiking weather app?

- Air quality 7%
- UV index 8%
- Sunrise/sunset times 16%
- Trail-specific forecasts 36%
- Alerts for severe weather 33%

4. Requirements Development

- **Aim:** Hikers using the online weather app aim to obtain accurate data on the weather at different points along hiking trails. This will help them to stay informed about the conditions, both while planning, and during their trips. It will allow them to see this data both for pre-defined trails as well as community contributed ones.

- **Sources of Satisfaction:**
  - **Accurate Forecasts:** Hikers will be satisfied by the app showing them accurate and up to date information to hikers.
  - **Ability to contribute trails:** Hikers will be satisfied by helping others in the community.
  - **User friendly interface:** Hikers should be able to easily understand how the app works and use its features effectively, without any technical knowledge required. This should make using the app a good experience.

- **Knowledge and Skills:** The app should be accessible to all hikers regardless of how experienced they are. To achieve this, it could have functionality such as showing tips on what to wear or what to bring with you based on the weather conditions. It could also link users to useful resources about hiking, though this may be outside the scope of the app.

- **Attitudes to Work:** Some hikers may be enthusiastic about enhancing their hiking experience with the app as well as allowing for more efficient planning. Others may be less interested in the app especially if they are not as tech-savvy. Therefore, the app needs to be simple, easy to use and reliable. It will also not require the user to register or log in before using the app making it as frictionless as possible to start using it.

- **Work-group Attributes:** Some hikers may have a sense of community and will be more willing to use the app if it allows them to contribute to the app's content. This could include functionality such as community contributed trails.

- **Feature of Activities:** Different users will use the app with different frequencies depending on how often they go hiking. Use of the app may be more fragmented while hiking as they may need to keep up to date with any potential changes to the weather forecast.

- **Responsibilities:** Hikers should attempt to minimise their impact on the environment, for example by making sure not to leave any litter along trails, as well as respecting any wildlife or plants they encounter. They should also be aware of any potential risks such as weather changes, which the app can assist with by providing alerts for weather warnings.

- **Working Conditions:** Hikers will be using the app both at home and while hiking, so as it will be used outside it is important that information displayed is easily readable in various lighting conditions. The colours used for backgrounds and text should be chosen with this in mind.

5. Design

How our design benefits hikers

Incorporating weather details on the first page of the web app enhances user experience by prioritising critical information for hikers. By presenting weather updates upfront, users can quickly assess current conditions and make informed decisions regarding their outdoor activities, optimising safety and preparedness. This immediate access to weather information streamlines the planning process, allowing hikers to adjust routes, gear, and timing accordingly. Moreover, emphasising weather details on the first page underscores the app's commitment to user safety and reinforces its value as a reliable companion for outdoor adventures.

We've chosen to display all nearby trails on the trails page map, utilising colour coding. This feature offers users a swift and visually intuitive method to distinguish between trails. Each of these trails has brief descriptions and detailed images on the same page, streamlining user experience, enabling quick understanding and informed trail selection.

The chosen colours are specifically curated to accommodate hikers' usage of the web app outdoors, enhancing clarity amidst varying outdoor lighting conditions. By selecting colours that complement the natural environment rather than contrasting with it [2], the app ensures optimal visibility and readability even in bright sunlight or low-light settings.

Mockup of the app's first screen

The design shown below is how the web app will appear on mobile devices as this is where it will be most frequently used, however it will be responsive on both desktop and mobile devices. The first image is when the app is first opened, and the second is after scrolling down.

Task: Find Today's Temperature

Today's temperature at the user's current location is displayed on the first screen that is shown when the app is opened. From there, they will be able to swipe to refresh, updating the temperature, as well as see more detailed information below such as the hourly forecast.

To find today's temperature in a different location specified by the user, the search can be used to find and navigate to the page for any location, which has the same layout as the screen showing the current location's forecast.

The steps for finding the temperature in a specific location are shown visually below:

Summary

The app is first and foremost a weather app, and this is reflected in the first screen which shows the forecast at the user's current location. More detailed weather data that may benefit hikers is also available by scrolling down. The hiking functionality is also important which is why the trails are accessible just one click away from the main screen, as well as allowing locations and trails to be easily found using the unified search bar which is always visible at the top of the screen. Once a trail is selected, detailed weather information for it is shown to users which will help hikers with planning as well as keeping them updated while hiking.

6. Project Roadmap

Timeline

Task	Date start	Date end	Checklist
Set Up	26th Feb 2024	28th Feb 2024	- Set up GitHub - Ensure all team members can access it - Allocate tasks to each team member
Basic Structure	29th Feb 2024	4th March 2024	Set up basic structure
UI	5th March 2024	11th March 2024	Implement design/UI
API integration	8th March 2024	15th March 2024	- Integrate weather API - Dynamic icon based on weather
Additional Features	15th March 2024	20th March 2024	Implement additional features such as multi day forecast, hiking trail recommendations or submitting user trails
Review	20th March 2024	22nd March 2024	Review and conducting tests for bugs

Division of Tasks

Kenji – Integrating weather API, handling data fetching, and ensuring seamless communication between react components and API.

Joseph – Implementing responsive design for optimal cross device functionality and actively supporting and collaborating with team members on their tasks.

Pranup – Assigned to implement the map interface with trail recommendations.

Cristina - Responsible for setting up the initial react project structure and creating basic components for the weather app interface.

Meldy – Assigned to implement the user interface, focusing on the weather interface for displaying weather information.

Problems

While each team member possesses proficiency in HTML, CSS, and JavaScript, most of them are newcomers to React. To bridge this experience gap, the team has actively engaged in hands-on labs focused on React and utilized online resources. This proactive approach aims to

enhance their familiarity and expertise with React, ensuring a collective and well-rounded skill set within the team.

Finding reliable and accurate data for hiking trails may pose challenges, particularly as trails are often situated in remote areas. To address this issue, the team could establish collaborations with experienced hikers or hiking communities to access more dependable trail data. Alternatively, allowing users to contribute trail information is another option; however, implementing this feature within the given project timeframe might be challenging.

To facilitate effective collaboration and prevent miscommunication, the team plans to conduct regular meetings, both in person and online. Additionally, collaborative tools such as GitHub and Office 365 will be utilized to ensure everyone remains updated and aligned with project goals. In case of any miscommunication, weekly lab meetings will serve as a platform to address issues promptly, and further clarifications can be sought from demonstrators during these sessions.

7. References

[1] OutsideForce, "Hiking Statistics and Facts 2023: A Brief Insight," Outside Force Fitness, Mar. 02, 2023. https://outsideforcefitness.com/hiking-statistics-and-facts/

[2] "What is a good color combination, visibility for outside use," User Experience Stack Exchange. https://ux.stackexchange.com/questions/38334/what-is-a-good-color-combination-visibility-for-outside-use (accessed Feb. 21, 2024).

8. Contribution

Section	Contributor(s)
Section 1	Kenji Berry
Section 2	Meldy Asili Bile
Section 3	Cristina Georgiana Bicher
Section 4	Joseph Charlie Best
Section 5	Entire Group
Section 6	Pranup Hari Bhattarai

All group members have contributed equally to the assignment.