

ECS522U – Graphical User Interfaces (2021)COURSEWORK ASSIGNMENT 1: REQUIREMENTS & DESIGN**Group Members:**

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1. Primary Stakeholder Group

Description of Primary Stakeholder Group:

Our primary stakeholder consists of students within the education system, such as secondary school, college or university, who are inquisitive about the geographic aspects of weather. Our primary stakeholder represents individuals who are keen learners that want to discover more about the weather than *just* the current temperature. These students will be aged between 11 to 23, which reflects the age group for students in the UK. We intend to develop an educational weather app which will provide users with facts and explanations for key weather effects.

Reasons why this group will benefit from our Educational Weather Application:

We have targeted this specific age group as they are likely to be computer-literate – as they may have used computers and smartphones from a young age. Therefore, they may be more inclined to engage with the weather application we develop – in comparison to older generations who may find it harder to use a smartphone application. It is also likely that our primary stakeholder will own a smartphone as a study recently suggested that 90% of 11-year-olds own their own device ^[1]. Furthermore, age 11 is when students in the UK begin secondary school and thus start to learn about more advanced geography topics, such as meteorology. The weather application we develop could, perhaps, aid younger students with their studies and hence we have chosen to include all secondary school students in the primary stakeholder group.

Another reason why this specific age group would benefit and appreciate an educational weather app is because they tend to open multiple apps daily. 49% of millennials and 63% of generation x individuals open smartphone applications 1-20 time(s) per day ^[2]. This clearly indicates that short bursts of information is what engages students between ages 11 to 23. We intend for our weather application to contain updated weather facts and information to meet the needs of our primary stakeholder, who are clearly engaged with short bursts of information.

Inquisitive older students (university students) would also be interested in using our application. Most older students' central need for a weather application would be to simply check the current weather. Therefore, our application will primarily provide users with key weather data, such as the current temperature and weather forecasts. However, it is likely that there are a substantial number of older students who also want to learn more about weather and its effects. We intend for our application to provide weather facts and effects in a manner which will keep all users engaged. This will be achieved by displaying weather facts through the use of images, videos, short blocks of text and quizzes. This is to cater for all four types of learning styles ^[3].

As our primary stakeholder consists of students, they are more likely to use a weather application which provides them with information quickly and easily. This is due to the shortened amount of 'free time' which students have, due to homework, assignments

exams etc. Our weather application will display information in a manner which can be quickly grasped and understood by the user so that using the application is enjoyable whilst also being informative.

Commuting is also something which is common for all individuals in our primary stakeholder group. On average, a commuting distance for secondary school students is 3.4 miles ^[4] and 9 miles ^[5] for university students. This equates to at least an average commuting time of 20-minutes for our primary stakeholder. The educational weather application we develop could provide our primary stakeholder with an activity for their commute which is beneficial and interesting.

Summary:

In conclusion, there is a need for an educational weather application made for students. The only similar application available is made for only part of our primary stakeholder, as it is made for younger children ^[6]. The educational weather application we develop will be made for a larger age range and thus will engage more users. The educational aspect of our weather application will specifically target the primary stakeholder by satisfying their curiosity for weather facts and effects. This will be done in an engaging and user-friendly manner by providing the user with constantly updated facts and explanations.

2. Wider Stakeholder Groups

Secondary Stakeholders:

Secondary stakeholders refer to individuals/organisations who are indirectly affected by the application but may still be influential.

- **Parents** are a key secondary stakeholder as most of our primary stakeholder group are children. Therefore, parents will want to ensure that the application is safe and beneficial for their child.
- **School institutions** refer to secondary schools, colleges and universities. They will play a key role as they could open our weather application to a larger user-base if the application is educationally beneficial for their students. Therefore, it is important we keep school curriculums in mind when developing the application.

Tertiary Stakeholders:

Tertiary stakeholders are those who are affected by the success of the application but do not directly use it.

- **Competing applications** are likely to see a reduction in their user-base if our weather application is successful. This is because if our application is successful, it may attract their current set of users, increasing our user-base.
- **The platform our application is hosted on** is also a tertiary stakeholder e.g Google Play Store, Apple App Store, etc. The platform may see an increase in usage if our application is successful. This would positively affect their business and perhaps earn them more revenue.

Facilitating Stakeholders:

The facilitating stakeholders are the individuals/organisation who will design and develop the application.

- **Application developers** – the weather application will be developed by our group (5 members). We will be responsible for ensuring a robust, user-friendly application is produced which meets all the requirements of our primary stakeholder. In addition, we will need to provide consistent support and updates for the application and thus will have a vested interest in the weather application and its success. Although the application is not designed for our needs, it is important we consider the needs of our primary stakeholder when developing the application.

3. Data Gathering

a)

We created an online questionnaire, which surveyed the primary stakeholder's age, occupation as well features they would expect to see. Due to the age of the primary stakeholder, it is likely they are accustomed to using online forms. Therefore, online forms were the quickest way to gather data efficiently. We opted to create a questionnaire to gather data because they are inexpensive compared to other data gathering techniques, such as interviews. Gathering large amounts of meaningful data is also more difficult when conducting interviews as they are time consuming. The questionnaire provided us with large amounts of data cheaply and quickly.

b)

What Is Your Age Group?
20 responses

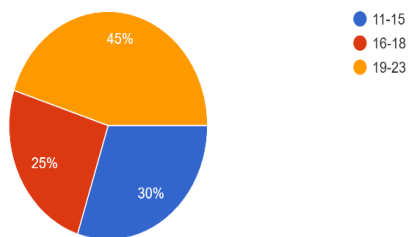


Figure 1

What Is Your Current Occupation?
20 responses

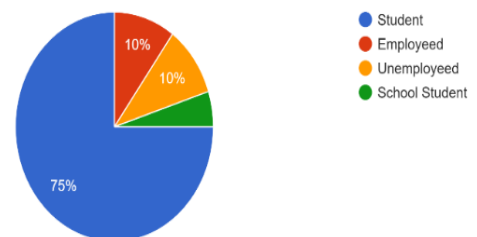


Figure 2

The majority of respondents to the questionnaire were between ages 19-23, which is within our targeted age range of 11-23. The distribution of the respondents' ages were quite close together. This validates our original hypothesis of there being a market for an educational weather application specifically made for students. It also means that our design will have to cater for students meaning it will have to be engaging and intuitive to use.

As expected, most of the respondents' current occupation were students. This is because we distributed our questionnaire amongst our primary stakeholder to ensure the data we gathered was specific to them. However, there was a sizeable minority who were also employed. This group may utilize our educational weather application on their commute to work to keep themselves occupied.

What Topics Are You Interested In?

20 responses

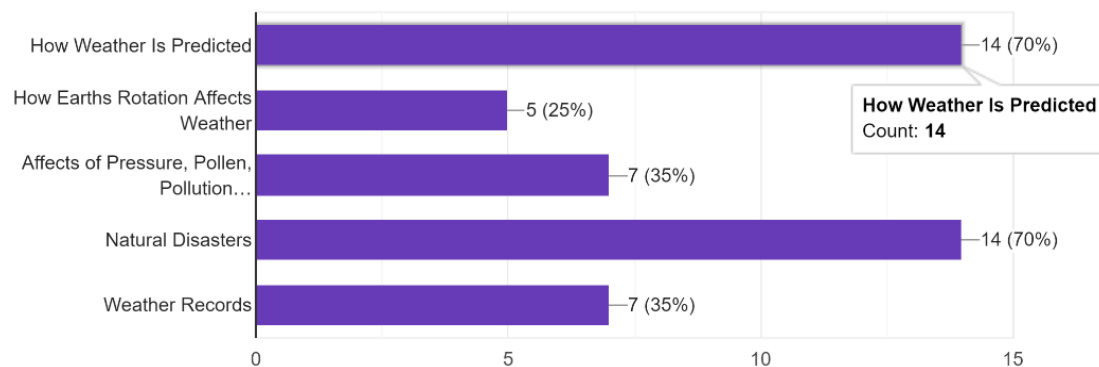


Figure 3

Respondents were most interested in weather prediction and natural disasters. These are two areas which will be implemented in the application, with updated interesting natural disasters being shown to the user daily. Weather records and affects of weather conditions were also topics which respondents found interesting. These will also be presented to the user in separate screens.

How Would You Like To Learn About These Topics?

20 responses

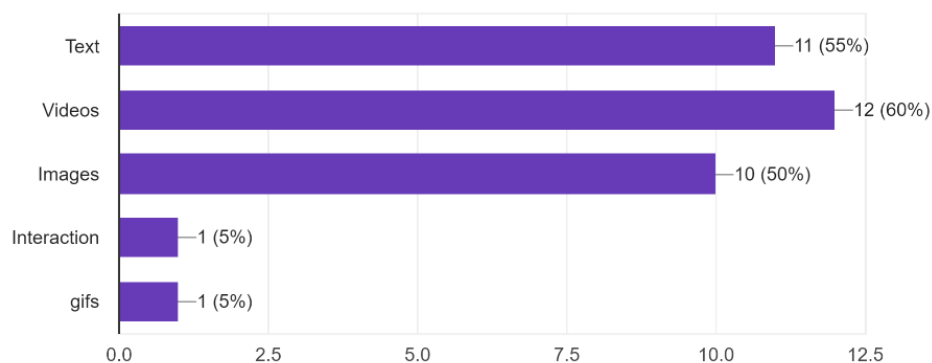


Figure 4

From the data we have gathered, video-based content was the most sought-after format of education, so we will mostly incorporate videos in conjunction with text-based content. Videos may be the most popular however text-based content is easier to update and so we will have both in parallel.

What Features Would You Use The Most On A Weather Application?

20 responses

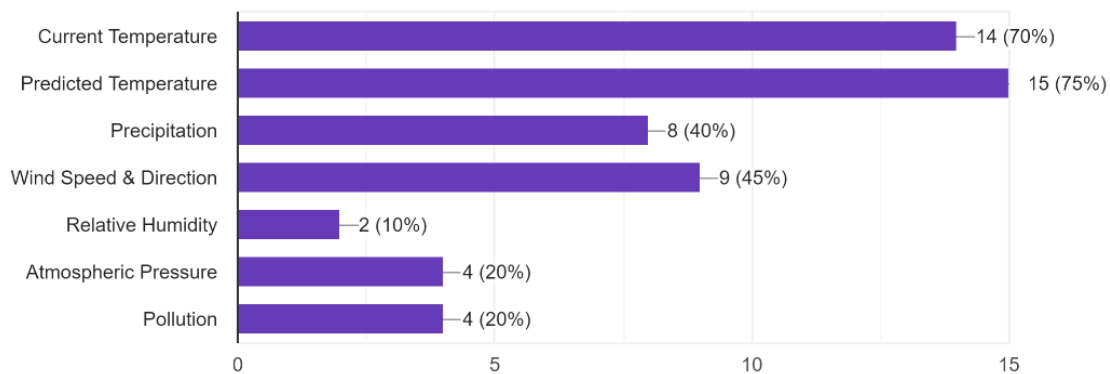


Figure 5

From the 20 responses we collected, the two most requested features were that the application should show the current temperature and weather forecasts. It is clear from the data that the core functionality of our educational weather app should be to provide current weather data, first and foremost. This means that the current temperature should be displayed on the front page and should be easily visible. Similarly, predicted temperature values should only be a few screen interactions away.

In contrast, only 20% of the responses asked for a 'Relative Humidity' feature so we will avoid including such a feature in our first version of the application.

What Would You Like To See As Soon As You Open The Application?

20 responses

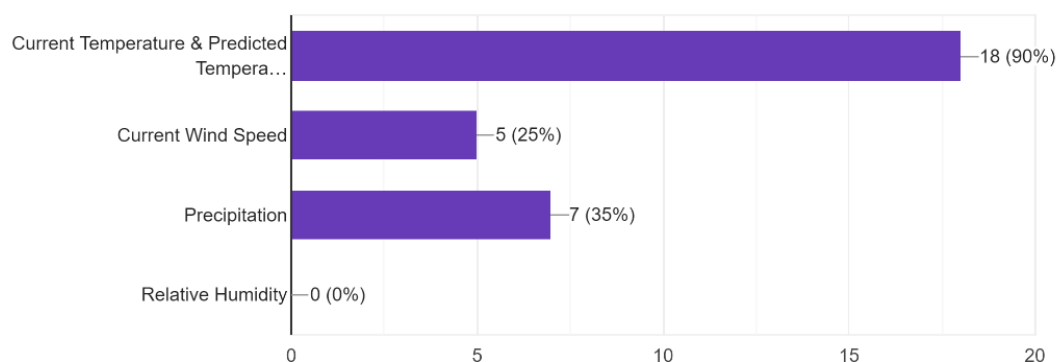


Figure 6

To further solidify our previous observation, 90% of people agreed that current temperature and predicted temperature should be accessible from the front page to reduce overall time consumption while access the app. This is also because our applications primary requirement is to be a weather app and so we must prioritise this. In contrast, they would not want relative humidity on the front as it is not a priority for students.

What Would You Use The Data On The Weather Application For?

20 responses

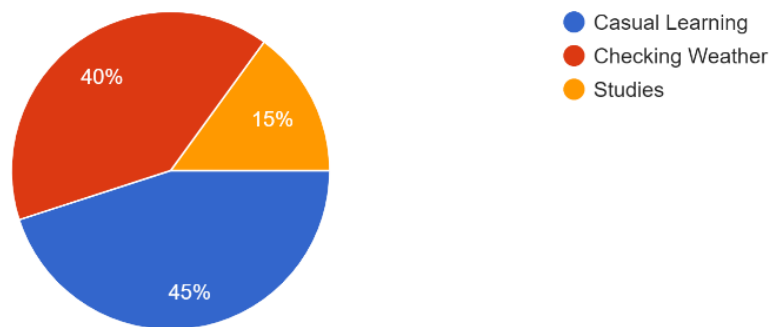


Figure 7

The primary stakeholder would use our weather app mostly for casual learning which could be for their own hobbies or their own personal project while a small portion of people would use it for checking weather.

What subjects would you use the application for?

20 responses

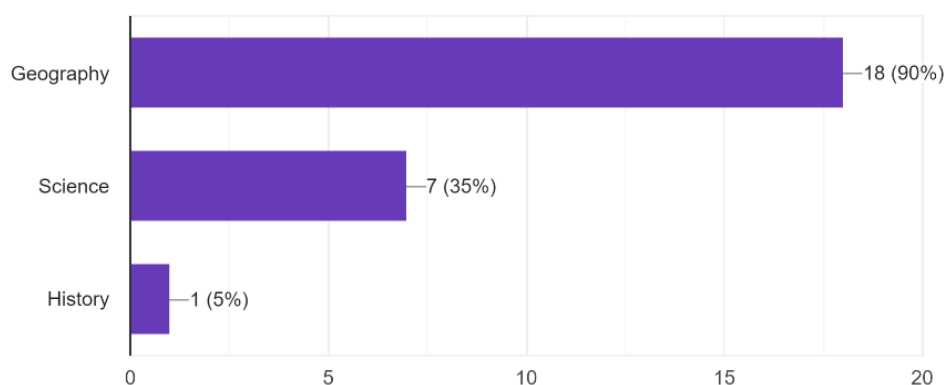


Figure 8

We decided to ask a further question to determine the specific subject which our primary stakeholder will use the application for. 90% of respondents stated they would use the application to aid their Geography knowledge. This means that our application must contain accurate information to ensure that it can support their Geography studies.

4. Requirements Development

Aims:

The main goal of the primary stakeholder will be to check the weather as well as learn facts and affects about the current weather. If the application is successful, our primary stakeholder will have gained useful knowledge and a better understanding of meteorology. This includes users learning new facts and grasping key concepts about weather which they may have not known before using the application. In addition to this, the primary stakeholder will measure the success of the application by how engaging it is and how often they want to use it to satisfy their curiosity about weather.

Sources of Satisfaction:

The gathered data suggested that most of the primary stakeholder group would utilise the application for casual learning. Their source of satisfaction would come from learning new information from the application. Hence, the application must present the user with weather facts in a manner that is engaging and enjoyable, so that new knowledge can be gained. 40% of respondents also stated that they would use the application to simply check the weather. This group's source of satisfaction would come from the application providing them with the current weather in a visually pleasing manner, for the information to be grasped immediately.

Knowledge and Skills:

Since our primary stakeholders are mainly students, they will be keen to learn about the weather and the effects of weather conditions. They may also have prior knowledge of Geography and Meteorology and may want to further that knowledge by using our application. 90% of respondents to the questionnaire stated they would use the application to aid their Geography knowledge. This is likely due to their prior knowledge and interest in Geography and the links it has to Meteorology.

Work Attitudes:

Our primary stakeholders are people aged between 11-23 and this would mean they would be more familiar with a mobile application and they would prefer accessing our application through their mobile phones, unlike people of an older age. This also makes it easier for them to access our application anywhere as a mobile phone is portable rather than it being a desktop application. Younger people are also generally more open to using new applications and technologies.

Work-Group Attributes:

The application will have to satisfy our primary stakeholders and would need to be acceptable. The way we can do this is by having the two most requested features (predicted weather and current weather) both on the homepage. This means that they can open the application and have the information accessible quickly, without them having to press anything. This will also save time as they may need to quickly check what the current weather is.

Features of Activity:

The application is made for the exact purpose of people who want to learn more about how weather works but also want to check the temperature and weather conditions. The users may check the application every day to observe the weather conditions for the rest of the day. Whilst they check the weather, they may decide to learn about different aspects of weather and the explanations behind them, such as how the weather forecast presented was predicted.

Responsibility:

The primary stakeholders may have some concerns about their privacy and the users may choose if they want their location to be accessed by the application, for a better weather reading. If they decide to give their location, our application will ensure their information is kept securely and will abide by Data Protection laws. Because part the primary stakeholder group are children (55% of respondents were between 11-18), no personal details will be stored about the user.

Working conditions:

The majority of the primary stakeholder group are either students or employed, meaning that there is some commute time involved as part of their everyday activities. Therefore, it is likely that the application will be used during their commute, for example on a bus, train, car, etc. Our application could fill this commute time with something enjoyable by providing users with interesting weather facts for them to read during their commute.

5. Design

a)



Figure 1

Figure 1 depicts the current design for our application. The application will be primarily designed for smartphones and thus the resolution of our design is one that is akin to the viewport resolution of a modern smartphone (393x851). We have decided to develop the application for smartphones as most users are likely to own a smartphone. ^[7]

We decided to put the current temperature value at the top of all screens. This will make it easy for users to quickly read and understand the current temperature. The user's current location will also be shown to reassure them that the current temperature is accurate for their location.

Predicted temperature values for hours and days will be provided to the user in a list format (Figure 1, screen 1). Displaying this information in a list format will allow the user to instantly read predicted temperature values, without the screen being cluttered with too much information. The user will be able to slide the lists to reveal more hours/days – up to the next 5. The final list will display other weather conditions, requested by the primary stakeholder.

The navigation pane at the bottom will make it easy for users to navigate between the different screens.

b)



Figure 2

Figure 2 depicts a design of the first screen which will be shown to the user, once the application has been launched.

From the Data Gathering we conducted on our primary stakeholder, the two most requested features were that the application should show the current temperature and predicted temperatures. Because of this, we have decided to put this information near the top of the screen using horizontal lists.

Other requested features from the questionnaire were that the application should display: wind speed, precipitation, pressure and pollution values. Information about these conditions will also be presented using a list, and the user will be able to click on each condition. Clicking on a condition will display another screen, which will show key effects of the chosen condition.

Each list will only show 3 items, to ensure the user is not overwhelmed with text. However, as mentioned, these lists will be scrollable (left-to-right) which will display more items.

We also intend for the background colour of the application to reflect the time of day. For example, the background will be similar to the one shown in Figure 2 during the day.

However, when it gets dark, it will automatically change to a darker background. This will reduce eye strain for the user and make the user experience more enjoyable.

We have decided to place the navigation pane near to the bottom of the screen to ensure it is easily reachable. This will make navigating between the different screens of the application much easier for the user.

As previously stated, the application will be developed for smartphones. However, because we are developing an educational app, some users may spend more time using it and thus may be more inclined to use it on a larger-screen device. Therefore, we also intend for the application to resize and scale for larger devices, such as tablets. Nevertheless, our primary focus will be to firstly develop the application for smartphones, and then scale for larger devices. This is because mobiles currently have 55.68% of worldwide market share^[7] and as a result, most users are likely to own a smartphone and not a tablet.

c)



Firstly, the user unlocks their phone and taps/presses on the icon corresponding to our weather application.

This launches the application, and the user is then asked to allow the application to access the device's location.

If the user allows location access, the overlay box will disappear, and the user will be shown "today's temperature".

d)

To summarise, the weather application we intend to develop will provide the user with the current temperature and predictive temperatures, for the next 5 hours and 5 days. It will also provide the user with values for 5 other weather conditions (requested by the stakeholder): wind speed, precipitation, pressure, pollution and UV. The information will be provided to the user in horizontally scrollable lists, making it easier for the information to be viewed. The user will be able to click on weather conditions to learn more about them and their affect, as the app is made for education.

Application used to create design:

Adobe XD was used to create the design for our educational weather application as it is an easy-to-use tool which provides artboards for all types of devices. The artboard chosen for our design was a modern smartphone with a viewpoint resolution of 393x851 pixels. Adobe XD also has useful tutorials for beginners and is a free tool which anyone can utilise to create a design mock-up for an application.

6. Project Roadmap

At the beginning of our research, we decided that we should split our workflow into individual sections which can be assigned to individuals with higher skill level or interest in the section at hand.

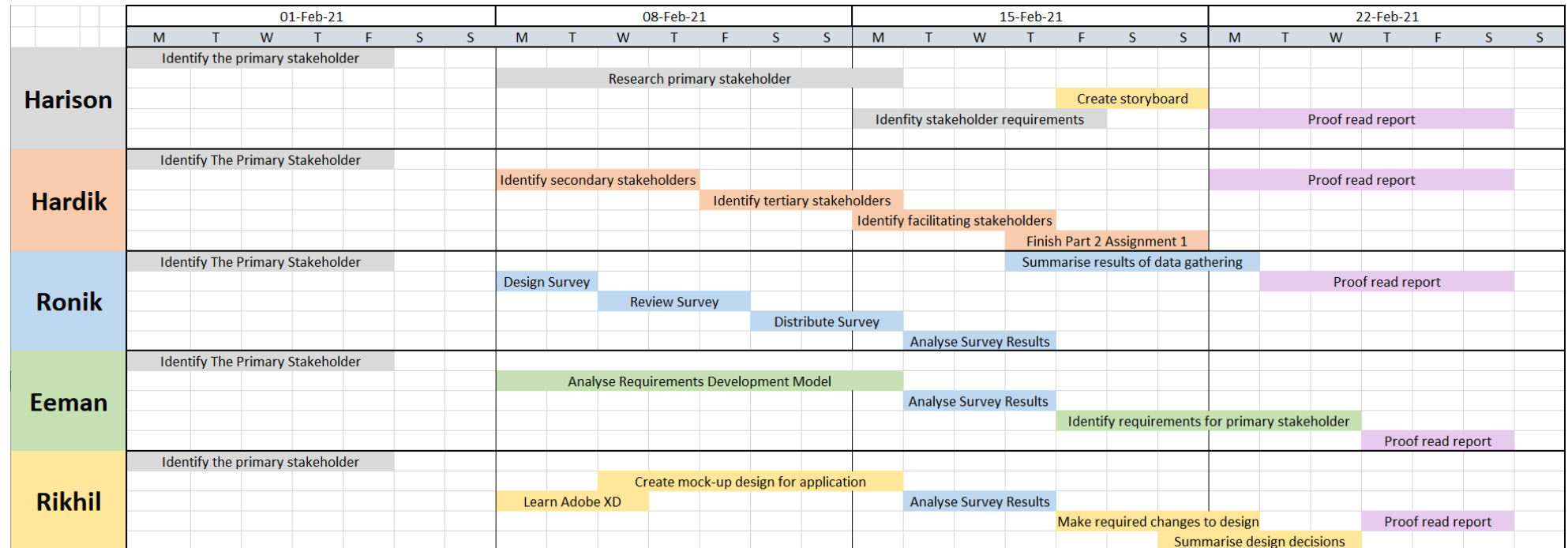
Name	Task	Skills
Harison	Primary Stakeholder Group	Research Skills
Hardik	Wider Stakeholder Groups	Research Skills
Ronik	Data Gathering	GSuite Skills
Eeman	Requirements Development	Problem Solving Skills
Rikhil	Design	Adobe XD Skills

While completing the stakeholder research, we encountered many issues where our weaknesses started to show.

- **Communication:** During the first few days, communication was difficult as we did not have a clear discussion or idea. Therefore, we decided to implement a discord server as well as a WhatsApp group chat where we communicated and updated work progress throughout the days.
- **Time zones:** Some of us in the group live in different time zones which made it difficult for us to agree on a time to hold a meeting and work on certain parts of the project together. We resolved this weakness by ensuring meetings were set at a time that was accommodating for all group members.
- **Work commitments:** A few of the group members also had part-time jobs so we had to cater our meeting times to not clash with their shift. Therefore, we had to plan out our schedules to cater to everyone's personal and educational timetable.
- **Report writing:** Our general writing skills were not to scratch, for example our spelling and punctuation skills. To ensure the report was written correctly, each of us proofread through the document several times and spotted out any literacy errors.
- **Time management:** We had multiple issues where we could not complete our assigned tasks to the scheduled times due to other priorities in other modules or work shifts. We solved this by creating a shared timetable which included our free times, which we would schedule our meetings based on.

Front-End Development Skills:

The application will be developed using React, which is a front-end JavaScript library. However, no group member has any experience coding in React or similar JavaScript libraries, therefore we intend to watch tutorials and use online guides to familiarise ourselves with the library. This will help us to create a functional and usable educational weather application which meets the requirements of our primary stakeholder group.

Gantt Chart:

Key:	
Primary stakeholder	
Wider stakeholders	
Data gathering & results	
Requirements development	
Design of application	

We decided to track the work of each group member using a Gantt chart. This helped to ensure all group members met deadlines for each task. This was vital as some tasks relied on the results of others. For example, the requirements for the primary stakeholder group could not be identified until the questionnaire results had been analysed.

Currently, our Gantt chart only includes tasks from the stakeholder research, requirements elicitation and design parts of this project. However, once we begin the next stage of this project (implementation), we will include the tasks involved using another Gantt chart. We intend to assign tasks to each group member from 1st of March for the implementation stage so we can work on the project efficiently. The end of the Gantt chart, above, represents the deadline for the initial report.

Member Contribution:

Name	Tasks	Percentage Completed	Quality of Work	Meeting Attendance
HARISON SUNDARAMOORTHY	Primary stakeholder group, proof reading	100%	100%	100%
HARDIK SACHDEVA	Wider stakeholder groups	100%	100%	100%
RONIK KAMLESH	Data gathering, questionnaire distribution, proof reading	100%	100%	100%
EEMAN KANWAL	Requirements development	100%	100%	100%
RIKHIL SHAH	Design, proof reading	100%	100%	100%

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