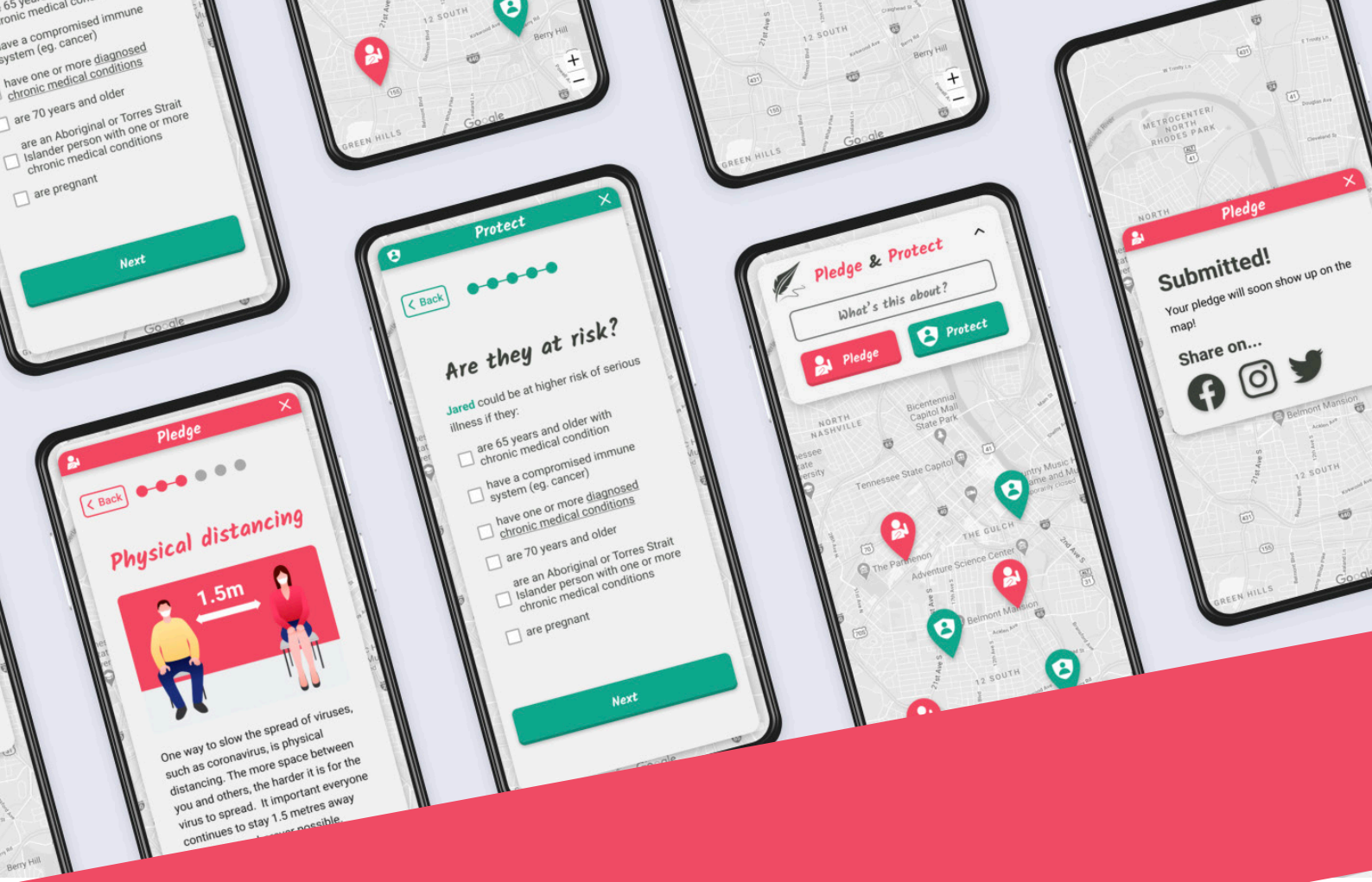

DECO3200 Assessment 3

High-Fidelity Prototype & Documentation

Pledge & Protect

By Nancy Nguyen, Griffen Edge & Raunak Sitoula

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Introduction

Our problem area relates to young Australians staying COVID-Safe, specifically through "actioning positive behaviour and accountability", as people aged 18-35 are by far the leading demographic for COVID-19 infections (Australian Government Department of Health, 2020); attributed to carelessness due to misinformation about the importance of staying COVID-Safe. Bevel et al. (2020) found that "people often unconsciously act as a continuing danger to themselves and others." From our initial primary research, we found that an overwhelming majority of young people understand the importance of COVID-Safe behaviours; however, they were often unable to put it into practice due to old habits, peer influence, and forgetfulness.

Pledge & Protect is a community mapping of loved ones that need to be protected from covid-related complications and people who pledge to practice physical distancing and other COVID-safe behaviours. Our solution provides a persuasive and empathic approach in helping young people to stay accountable and actioning COVID-Safe behaviour. This is through its focus on protecting others, aligning with the users' moral values and the sense of unity to act for the common good (Bavel et al., 2020; Smith et al., 2020). As seen in figure 1, our concept leverages the biggest motivator amongst research participants which is users want to avoid getting COVID-19 and passing it to their loved ones. Pledge & Protect also utilises people's sense of social duty in overcoming COVID-19 and helping to protect vulnerable members in society.

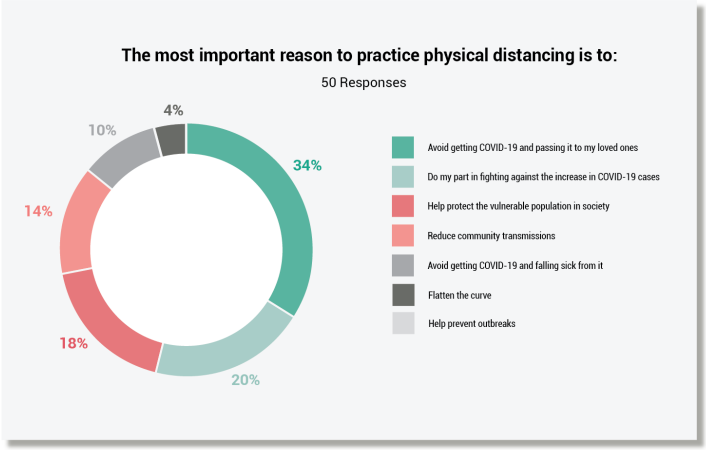


Figure 1: Users' motivations to pratice physical distancing

Through user testing, we found the benefits of our web app was that it placed a face on the vulnerable population, creates a sense of community and promotes empathy. Empathy is a significant driver in behaviours and would likely influence the actioning of positive behaviour for the benefits to oneself and others (Decety, Bartal, Uzefovsky & Knafo-Noam, 2016).

Through our research, we found that many young people get information from social media or their social network. Therefore, users will mostly find Pledge & Protect through their social network, which can be through someone they know telling them about the app or seeing it in on their social media. The social aspect of Pledge & Protect can help keep people accountable, as persuasive information involves the prospect of social group approval and complying with social norms (Cialdini & Goldstein, 2004).

To match the needs of our target audience, we ensure Pledge & Protect would help those who:

- Struggle to act in a COVID-Safe manner due to forgetfulness
- Behaviours are influenced by social approval and pressure
- Value protecting their loved ones, protecting vulnerable people and feel a sense of duty to their community
- Need personalised and emotional information to stay motivated and accountable

Design Process

The design process of Pledge & Protect was based on the Design Council's Double Diamond Framework. The following modified framework (figure 2) outlines the methods and tools used during the discover, define, develop, and deliver phase of Pledge & Protect (Nessler, 2016; Design Council UK, 2005).

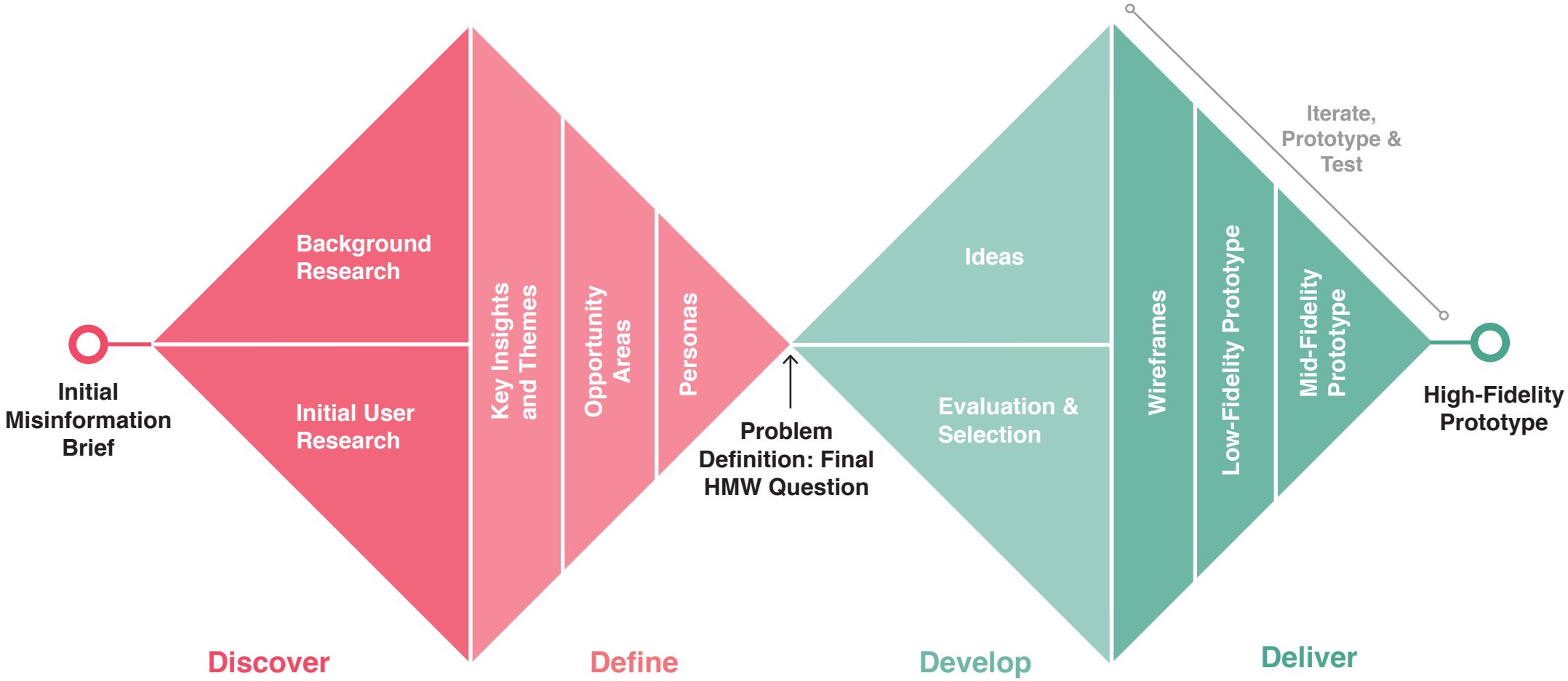


Figure 2: Design Process of Pledge & Protect

Discover Phase

During this phase, we aimed to research into misinformation and gain insights into the problem and our users (young Australians aged 18-35 years old) in relation to COVID-Safe behaviours.

Background Research

Stakeholder Analysis

A stakeholder analysis was conducted to understand the needs and expectations of significant parties that may influence the project and to identify which stakeholders have a strong influence on project success (Smith, 2000). The three key players identified included our target audience, our team, and NSW Health.

Literature Content Analysis

A literature content analysis allowed us to identify the varied reasons why young people do not practice effective COVID-Safe behaviours. The main reasons include reduced risk perception, optimism bias, influences of social norms, lack of persuasive COVID-19 resources and the need for social connection.

Market Analysis

Our market analysis revealed that there are a plethora of existing websites tackling data tracking and visualisations. However, none of the existing solutions appear to target young people in particular, nor do they try to make people feel more accountable for COVID-Safe behaviours.

Initial User Research

Research Plan

A research plan was created to define the problem space, establish our study objective and research questions, and select data collection and analysis methods. Refer to Appendix A for a detailed Research Plan.

Questionnaires

50 questionnaire responses were collected to find broad initial insights into the target age group and to guide subsequent methods (Tomitsch et al., 2018).

Interviews

A set of 12 semi-structured interviews were performed to gather more in-depth information on participants' behaviours and attitudes. Major themes explored in the interviews were current behaviours, motivations and understanding of being COVID-Safe.

Define Phase

During the define phase, we synthesised our findings to narrow down our focus, define our user needs, and establish opportunity areas.

Key Insights and Themes

We conducted a thematic analysis of our interview findings and quantitative data analysis on the results of our questionnaire. The following main insights were found:

- Users struggle to act in a COVID-Safe manner due to lack of consciousness of their self and their surroundings, forgetfulness, and the difficulty in breaking old habits
- Users are influenced by social pressure and norms
- The biggest reasons for people to engage in COVID-Safe behaviours are to protect their loved ones, protect vulnerable people, and help stop the spread of COVID-19.
- The need for social connection and interaction can override one's ability to act in a COVID-Safe manner.

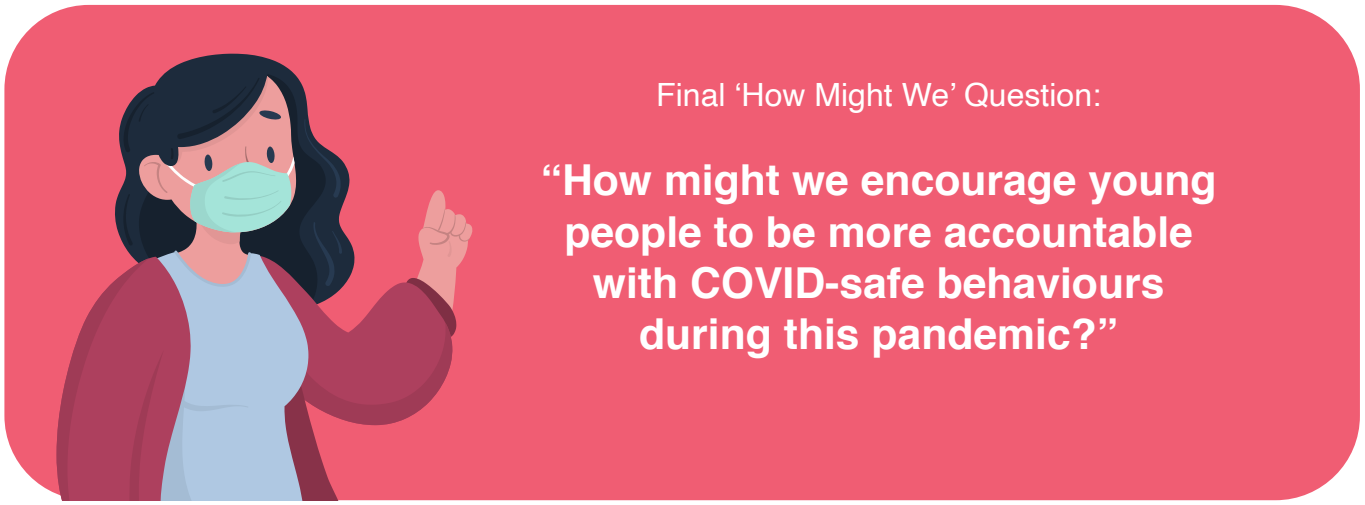
For a more in-depth breakdown of our findings, refer to Appendix B.

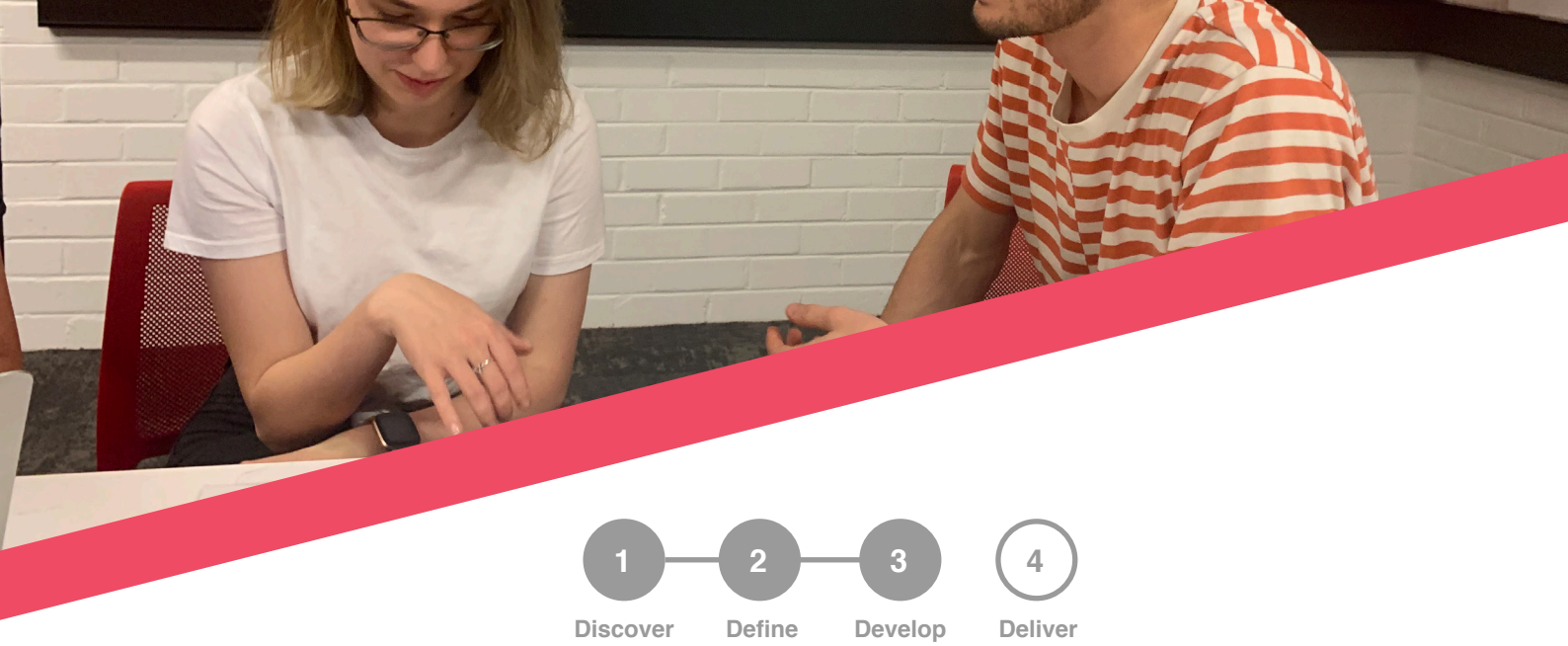
Opportunity Areas

Current solutions do not appear to target young people or try to encourage people to be more accountable for COVID-Safe behaviours. This is a gap in the market that we could fill. Current solutions tend to be impersonal, factual, and objective. Users need messages that appeal to their motivations to enact behaviour change. Our design can be persuasive by the "(i) emphasize benefits to the recipient, (ii) focus on protecting others, (iii) align with the recipient's moral values, (iv) appeal to social consensus or scientific norms and/or (v) highlight the prospect of social group approval" (Bavel et al., 2020, p462).

Personas

The themes were broken down into different representative traits and then grouped according to how these traits were, on average, found in our interview participants. We created two personas (Appendix C) to show motivations, frustrations, behaviours and demographic information of our main user group (Tomitsch et al., 2018). These personas represent the ideal target audience of our design solutions.





1 Discover — 2 Define — 3 Develop — 4 Deliver

Develop Phase

During the Develop phase, as seen in figure 3, we explored different potential solutions to address our defined problem space before evaluating and selecting our final concept.

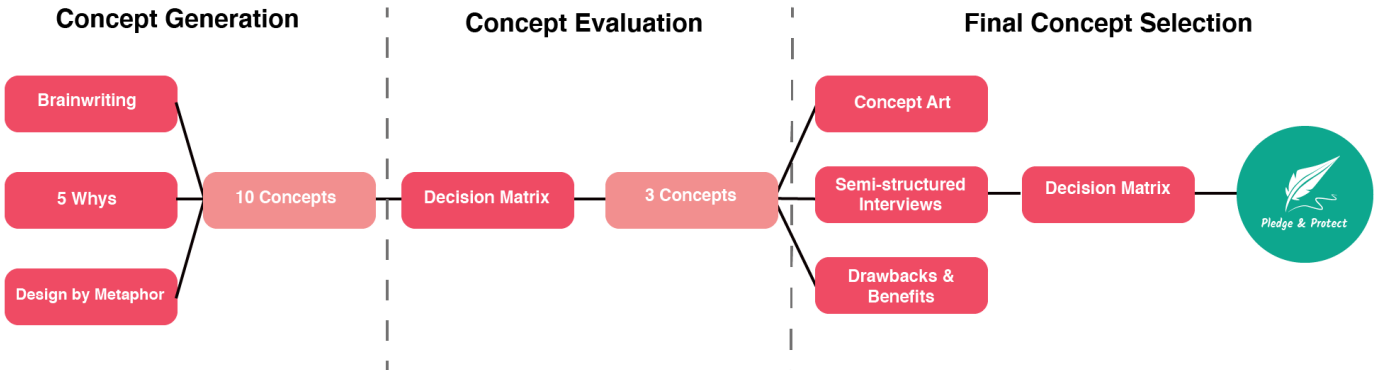


Figure 3: Develop Phase of the Design Process

Concept Generation

The focus of this stage is quantity instead of quality as it is best practice to consider many potential solutions before settling on any one of them (Harley, 2017). Building upon our findings, we began ideating designs to tackle this problem. We used Brainwriting to generate 6 concepts, 5 Whys to produce 2 more concepts, and Design by Metaphor for another 2 concepts.

Concept Evaluation

A Pugh's matrix was applied to the 10 initial concepts to eliminate the weaker concepts. This decision matrix also allowed us to hybridise stronger concepts together to generate three optimal concepts (Perry & Bacon, 2016). The following concept include Pledge to Protect, COVID Choices and Pandemic Hill.

Final Concept Selection

We aimed to select the most feasible and impactful concept out of our 3 concepts. Concept art such as sketches and storyboards were created to communicate our idea and its key features to users without having to compromise time and resources (Tomitsch et al., 2018). We then conducted concept pitches and semi-structured interviews with 5 users to examine the drawbacks and benefits of each idea (Appendix D).

The user insights aided in our Pugh's Matrix where we tested each concept against each other based on a weighted criterion of feasibility, ability to address the problem briefly, ability to meet user needs, long-term usage, and emotional connection to the user. The decision matrix enabled us to evaluate our three initial concepts and therefore select the optimal final concept - Pledge & Protect (Bischoff, 2016).

Deliver Phase

The deliver phase involved using an iterative design process to thoroughly develop our Pledge & Protect prototype from its initial early concept to a high-fidelity prototype.

Each iteration involved testing our design with at least 5 users as the "ultimate user experience is improved much more by 3 studies with 5 users each than by a single monster study with 15 users" (Nielsen, 2000. To ensure representation of our target audience, testing participants were selected to provide a wide range of genders, living situations, ages within the target age group (18-35 years old, and geographical regions in the Greater Sydney Area.

Table 1 breakdowns the different methods and tools used during each iteration.

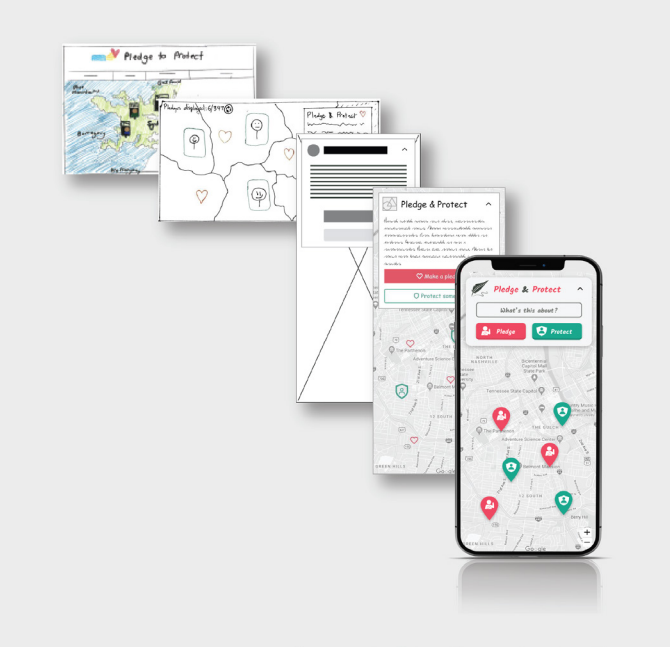


Figure 4 : Iterative Design of Pledge & Protect

Iteration	Aim(s)	Prototype Development **User Testing Tool***	Testing Methods	Analysis & Synthesis Methods
1	Translate the concept into user interfaces Address the drawbacks of the concept	User Journey Mapping Mind Mapping Sketchnotes **Sketched Wireframes***	Think Aloud Protocol Semi-structured Interviews	Affinity Diagramming
2	Refine interfaces based on user flow and experience	Digital Wireframes **Low-Fidelity Prototype***	Usability Testing Usability System Scale Icon Questionnaire	KJ Brainstorming Service Blueprint
3	Resolve any usability issues Refine interactions and visuals	Style Guide **Mid-Fidelity Prototype***	Think Aloud Semi-structured Interviews Heuristics Evaluation	Affinity Diagramming

Table 1: Iterative Design Process of Pledge & Protect

Iteration 1: Interface Development

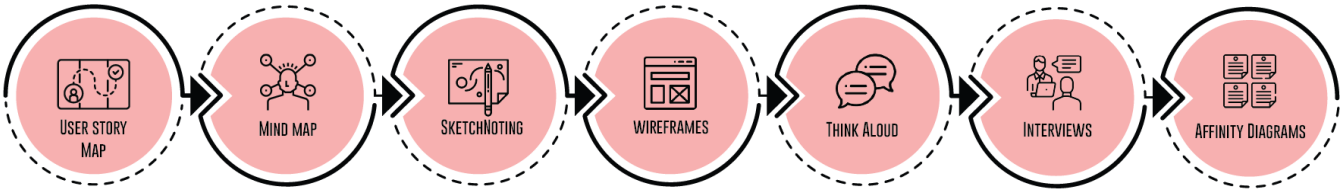


Figure 5: Methods & Tools used in Iteration 1

- **Aim:** Our first iteration sought to translate our concept into user interfaces whilst address the drawbacks of Pledge to Protect to align it with our problem statement and find the best direction in which to take the concept.
- **Prototyping:** WWe created an initial implementation plan with a user story map with all possible features from our early concept proposal. We then use mind mapping to identify the key features to include in the app, followed by a group sketchnoting session to organise these features into distinct screens. Finally, a click-through sketched wireframes prototype was created to flesh out our interface patterns and layout. Sketches wireframes are beneficial as they are a low-cost and rapid iterative design technique that allows us to gain design insights early in the process (Goldfield & Pernice, n.d).
- **Testing:** Five users were asked to verbalise their thought processes while testing the prototype using the think-aloud protocol. Semi-structured interviews were then conducted to compare the impact of changes to users upon the initial concept design. These results were organised using affinity diagramming to find patterns in our user feedback and identify design issues.
- **Outcomes:** From our findings, we decided to iterate our design to ensure more significant affordances to interactive elements on the home page, reformat and simplify the app forms, add back and next buttons to the forms so users can traverse them easier and make changes if necessary and add a risk evaluation section to the protect form.

Iteration 2: Interface Refinement

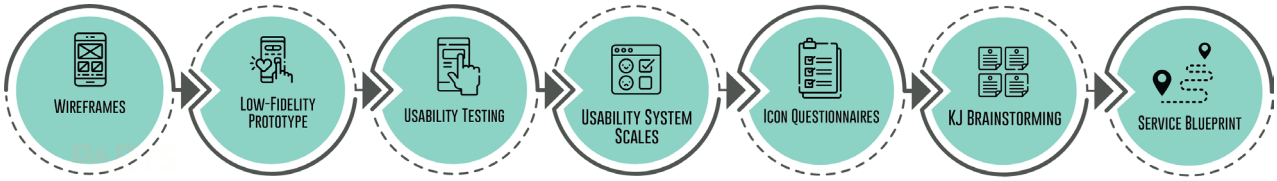
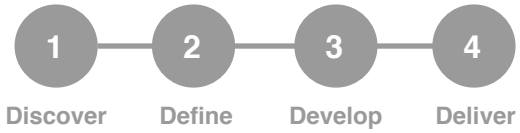


Figure 6: Methods & Tools used in Iteration 2

- **Aim:** We aimed to refine our interface design with a focus on usability, user flow and user experience.
- **Prototyping:** igital wireframes were designed in Figma for mobile devices as approaching the prototype with a mobile-first design allows us to make use of progressive enhancement (Gustafson, 2020). From the mobile wireframes, we created a low-fidelity figma prototypes to establish core user interactions and serve as resource-efficient testing tool (Tomitsch et al., 2018).
- **Testing:** To evaluate the prototype, we conducted usability testing on 6 participants using task-based usability testing and usability system scales. These tools allowed us to identify problems with our web app's design, find opportunities to improve and learn about our target users' behaviour and preferences (Moran, 2020). We then analysed the data by KJ brainstorming to collaboratively pinpoint and prioritise user issues with our design (Hanington & Martin, 2012). Finally, a service blueprint was made to put all of our findings into the context of the overall system.
- **Outcomes:** In response to identified user issues, we sought to redesign the pledge and protect icons to better represent their respective meanings, improve visibility of the interactive map pins and establish a clear distinction between Pledge and Protect to users. Finally, as users were confused with the features and purpose of the app, there would be an inclusion of onboarding screens.



Iteration 3: Usability, Interaction & Styling Improvement

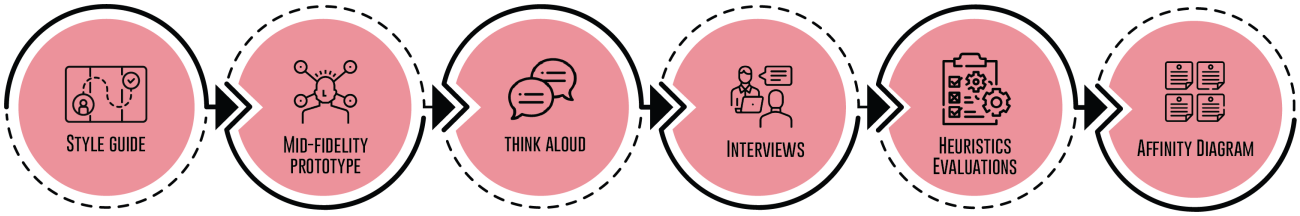


Figure 7: Methods & Tools used in Iteration 3

Aim

This iteration aimed to identify and resolve usability problems with our prototype. Also, the iteration's goal was to refine the interactions and styling of our design solution.

Prototyping

A style guide was created to guide our transition from a low-fidelity prototype into a mid-fidelity prototype . A mockup was created as the mid-fidelity prototype whilst incorporating feedback from the previous round of testing. The mockup focused on visual design, content, font types and colour schemes.

Testing

- **Think Aloud Protocol:** Our mid-fidelity prototype was tested with 5 users (Appendix E-1) from a diverse range of backgrounds (Appendix E-2). Using the think-aloud protocol, users verbalise their thought processes while completing the main tasks of our app. This enables us to see whether users can understand and use our product (Tomitsch et al., 2018).
- **Semi-structured Interviews:** After the completion of the think-aloud protocol, interviews were conducted to gain feedback on our interfaces. We were able to get insights into the positives, negatives, and potential design opportunities of the design.
- **Heuristic Evaluations:** In addition to user testing, heuristic evaluations were conducted with 3 experts to identify any usability problems (Appendix F) thoroughly. These evaluations ensure that our design solution will comply with common properties of usable interfaces based on the recognised usability principles (Nielsen, 1994).
- **Affinity Diagramming:** The collected data (Appendix E-3) was analysed by affinity diagramming (Appendix G). This analysis tool allowed us to find patterns and themes in the data to identify common user issues and potential design improvements (Tomitsch et al., 2018).

Outcomes

From our testing, we established the following proposed changes for our high-fidelity prototype:

- Larger crosses (x) for the exits of all pop-ups
- A collection of refreshable prompting questions to assist users in filling out the long response "story" part of the protect form.
- Reduce the size of the pop-up boxes so it looks it is integrated with the map
- Improved copywriting to ensure content is punctual and easy to understand
- Onboarding process which clearly explains the app's purpose and what it does
- Refined visual design so it is aesthetically pleasing with a balanced ratio of text and visuals
- Additional content so users can learn more about their community and COVID-Safety

High-Fidelity Prototype

The conclusion of the Deliver phase is creating a high-fidelity prototype - pledgeprotect.netlify.app/ A style guide and mid-fidelity prototype were used as implementation guidelines. Pledge & Pledge was implemented using HTML, CSS & JavaScript. Leaflet.js was used to create the interactive map, and Vue.js to make the web app more responsive and a smoother experience. We used Visual Studio Code to code the web app, on our laptops and desktops, and use Git with GitHub to version control and collaborate on our code. For viewing and testing the prototype, we use Netlify with a build script to automatically build and deploy our Vue web app on a live server and view and debug the prototype using the following web browsers: Chrome, Safari, Firefox, and Opera.

Figure 8: MosCoW Prioritisation Matrix

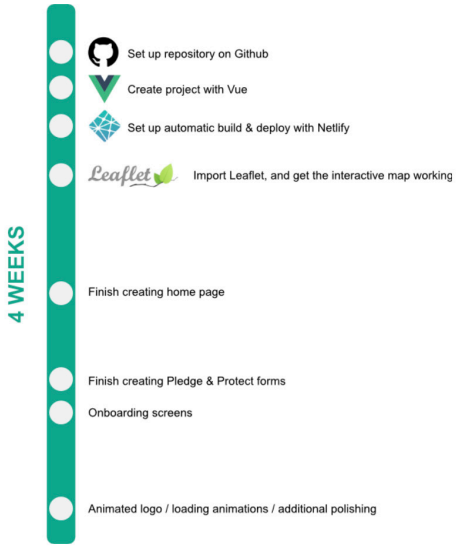


Figure 9: Development Timeline

A MoSCoW prioritisation matrix (figure 8) was used to create a hierarchy of priorities during the implementation of Pledge & Protect (Airfocus, n.d). Prioritised tasks were mapped out on a visual timeline (figure 9) to ensure we are on track and meet major development milestones.

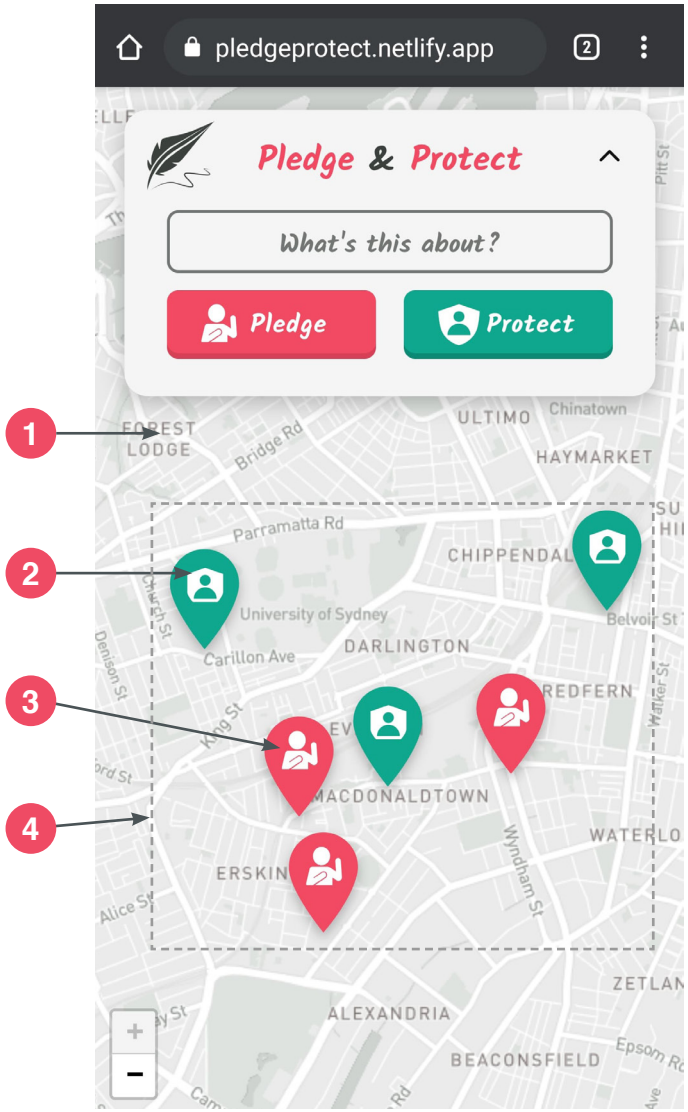
User Setup

Pledge & Protect is an interactive web app with a responsive design so users can experience on all devices, including smartphones, tablets, laptops, and computers.

Users will need access the internet and run a modern web browser such as Chrome, Safari, Firefox, Opera and Microsoft Edge. The preferred web browser is Chrome because the prototype was primarily viewed, tested, and debugged on Chrome. Users can access the web app available via the URL: pledgeprotect.netlify.app/

Figure 10: Responsive Design of Pledge & Protect

Core Functionality



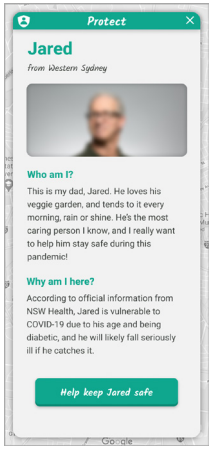
1 Map

- The map is based on your current location
- Map is soft-locked to NSW by snapping back if moved out of bounds.
- Shows a random selection of 3 pledge pins, and 3 protect pins on the map.

2 Protect Pins

When clicked, pop-ups appear that allows users to view vulnerable loved ones in the community.

Users are able to learn about the person and are given information on how they can help keep them safe.



3 Pledge Pins

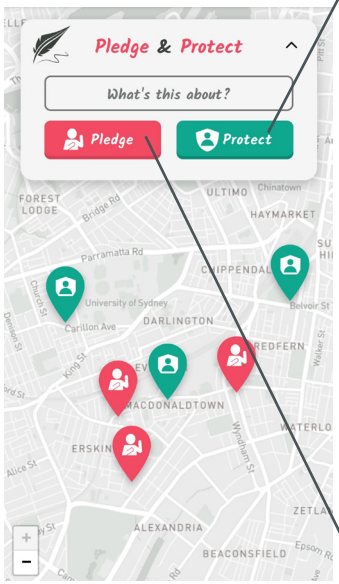
The pins opens up pop-ups which allow users to viewing people who pledge to be COVID-safe and why they are pledging.

4 Pins

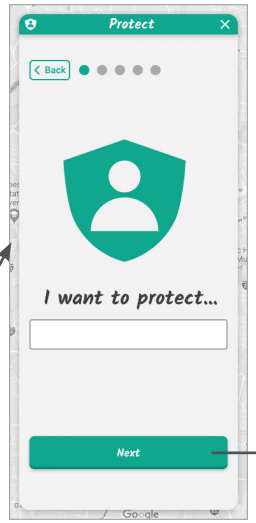
Pins refresh after you drag and move the map, and after changing the zoom level

As we do not have a database and real user data yet, the pins are currently placed randomly on the screen, with a few rules in place to keep them easily interactable:

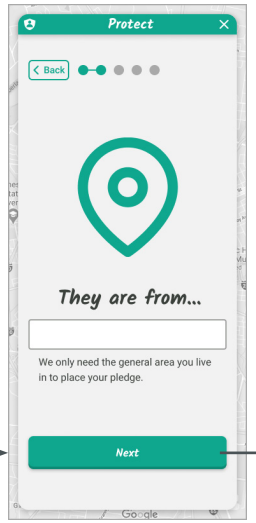
- Pins do not spawn underneath the floating menu.
- Pins maintain a minimum distance of 10% of the screen's width and height from the respective edges of the screen.
- Each of the 3 pledge and protect pins are spread out across 3 divisions of the screen horizontally, to keep them well spaced out.
- The 3 divisions that the pins spawn in are squashed towards the left side of the screen if the right side of the map is too far out to sea, to keep most of the pins from appearing in the South Pacific Ocean.



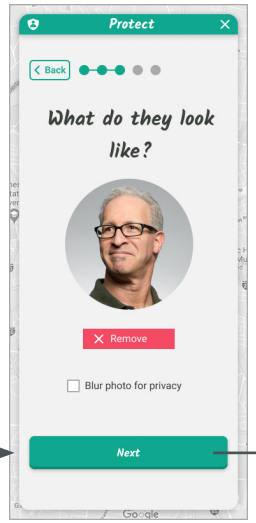
If users want to add a pledge and protect pin to the map, they can do this through the pledge and protect button on the menu bar.



Users add the name of an vulnerable loved one

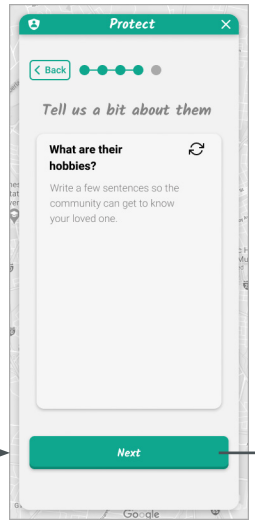


Users add their postcode. The point on the map would be randomised to a different point in the provided postcode

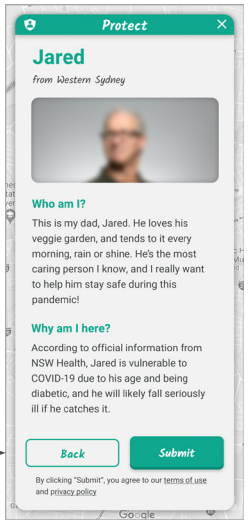


Users add a photo and blur it if desired

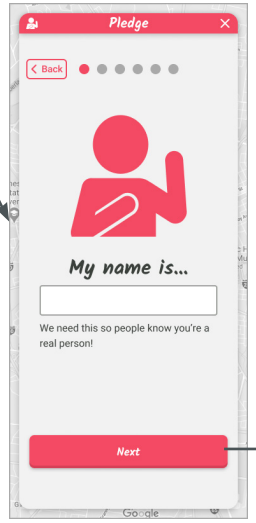
Users input why their loved one are at risk (as defined by NSW Health.



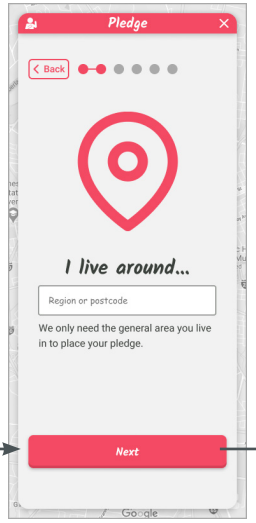
Users write a personal story to help others connect with their loved one. There are refreshable prompting questions to assist them.



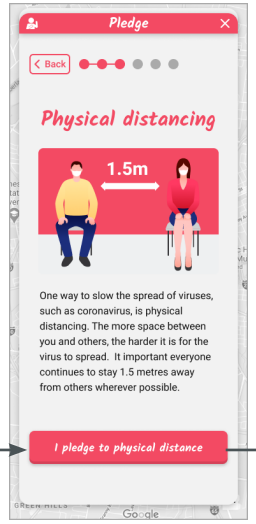
The form generates a profile of their loved one which can be edited or submitted to the map as a pin.



Users add their name.



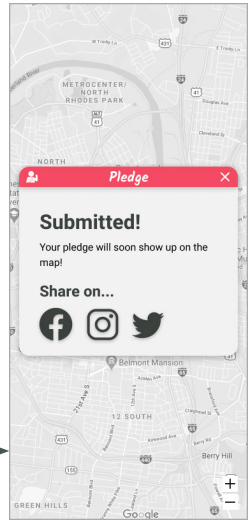
Users add their postcode



Users read and pledge to COVID-safe behaviours

They put in why they are choosing to pledge

A editable confirmation profile would appear.



The profile is added as a pin to map and can be shared on social media.

Setup for Future Development

Hardware & Software Requirements

Hardware

Computer or Laptop

Software

Node Package Manager

Git

A Text Editor - we recommend Visual Stuido Code

A Modern Web Browser -we recommend Chrome

Illustrated Setup

The project was developed on Windows, and the following setup process assumes you are using a Windows machine. While the setup process should similarly work on Mac and Linux, some of the steps and terminal commands used may be slightly different.

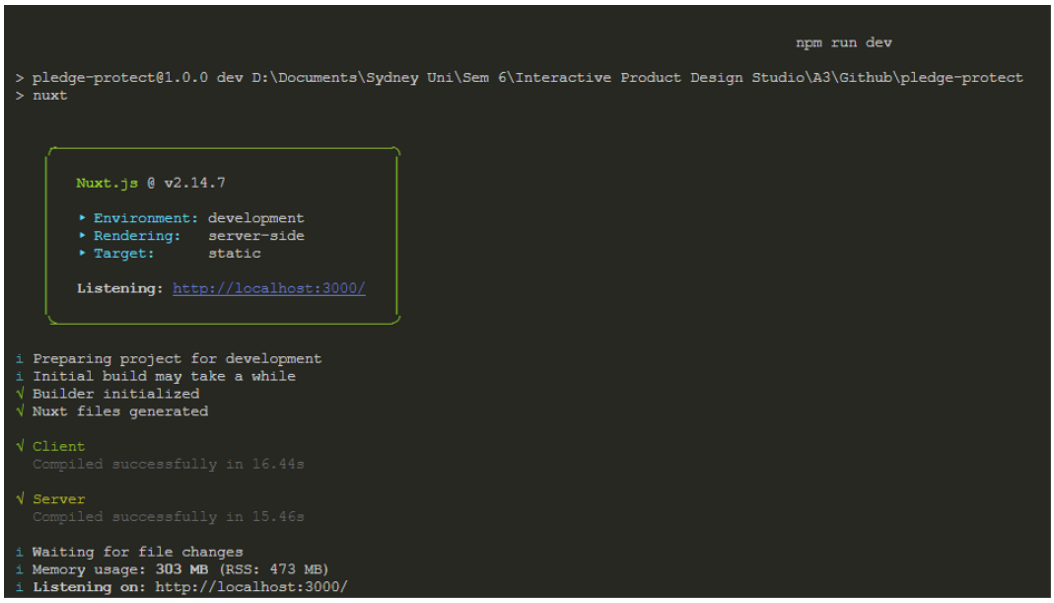
1. Make sure you have node package manager (npm) (version 6.9.0 or higher) installed on your computer. https://www.npmjs.com/get-npm
2. Make sure you have Git installed (ideally version 2.19.2)
3. Clone the project from the GitHub repository.
4. You will need a text editor. We recommend Visual Studio Code, with the Vetur extension.

```
                                                                    npm install
npm WARN vue2-leaflet@2.6.0 requires a peer of @types/leaflet@^1.5.7 but none is installed. You must install peer dependencies yourself.
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@2.1.3 (node_modules\fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@2.1.3: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"})
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@1.2.13 (node_modules\watchpack-chokidar2\node_modules\fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.13: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"})

audited 1402 packages in 13.148s
found 0 vulnerabilities
```

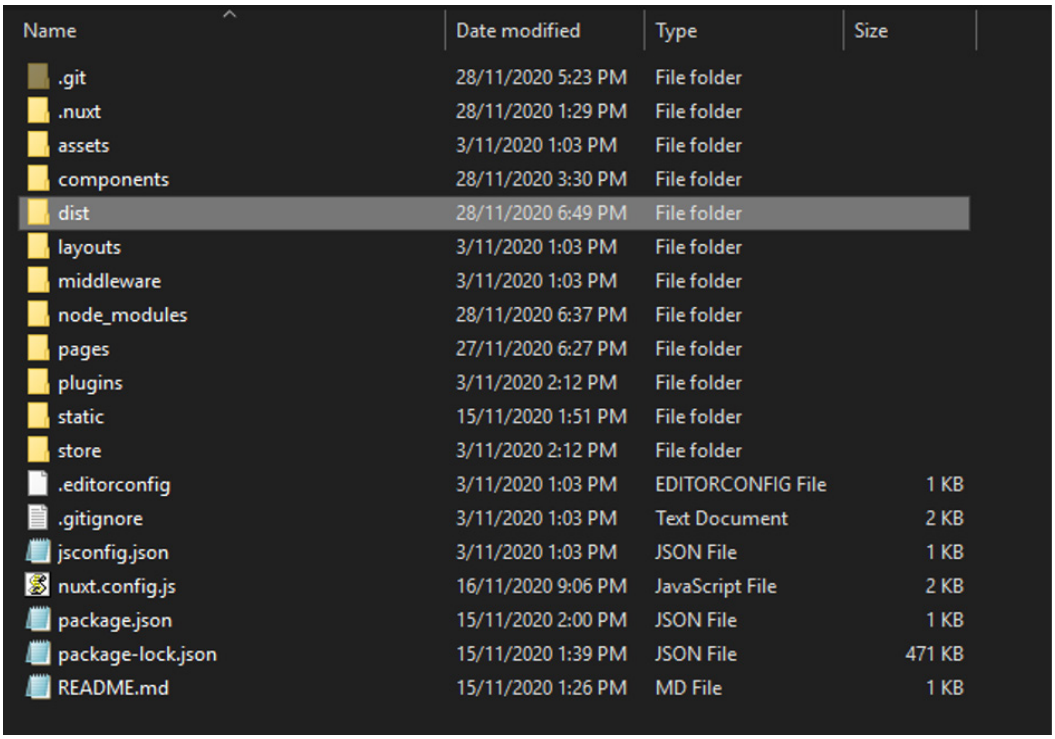
5 Open up the root project directory on your terminal (VSCode's integrated terminal, or Command Prompt/PowerShell, and run "npm install". This will install and update any missing dependencies for the project. Once it is done, you should see something like this:

6 To run the project locally and preview changes, on your terminal, run the command "npm run dev". You should see something like this:



You can preview the web app on the provided url (http://localhost:3000/ in above example), and it will automatically update with any code changes you save on the text editor.

7 To deploy the web app, you can run the command "npm run generate" command to generate a static website for the project in a folder named "dist" in the project's root directory.



And that's it! You are ready to start making changes and developing the project.

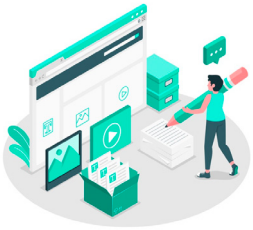
Future Works

Authentication

Future versions should include sign-up and logins so users can edit or delete their profiles, access things such as their form posts, and view a history of pins they have viewed.

Database

A database should be created to store data from the user forms and generate profiles. This will also entirely resolve the issue of pins appearing in invalid areas, like out at sea or uninhabited areas.



Engagement

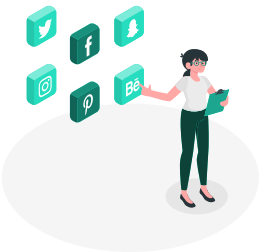
Users wanted more in-depth and engaging information on how to perform COVID-safe behaviours. For example, for hand-washing, they want to learn how to wash your hands and when to wash your hands. This issue can be solved by adding detailed information and supporting interactive content such as quizzes, gifs, videos.

Automatic Pin Generation

Future work should allow pins and profiles to be automatically generated on the map after a user submits a pledge or protect the form. The pins should be randomised to different points on the map based on the user's provided postcode.

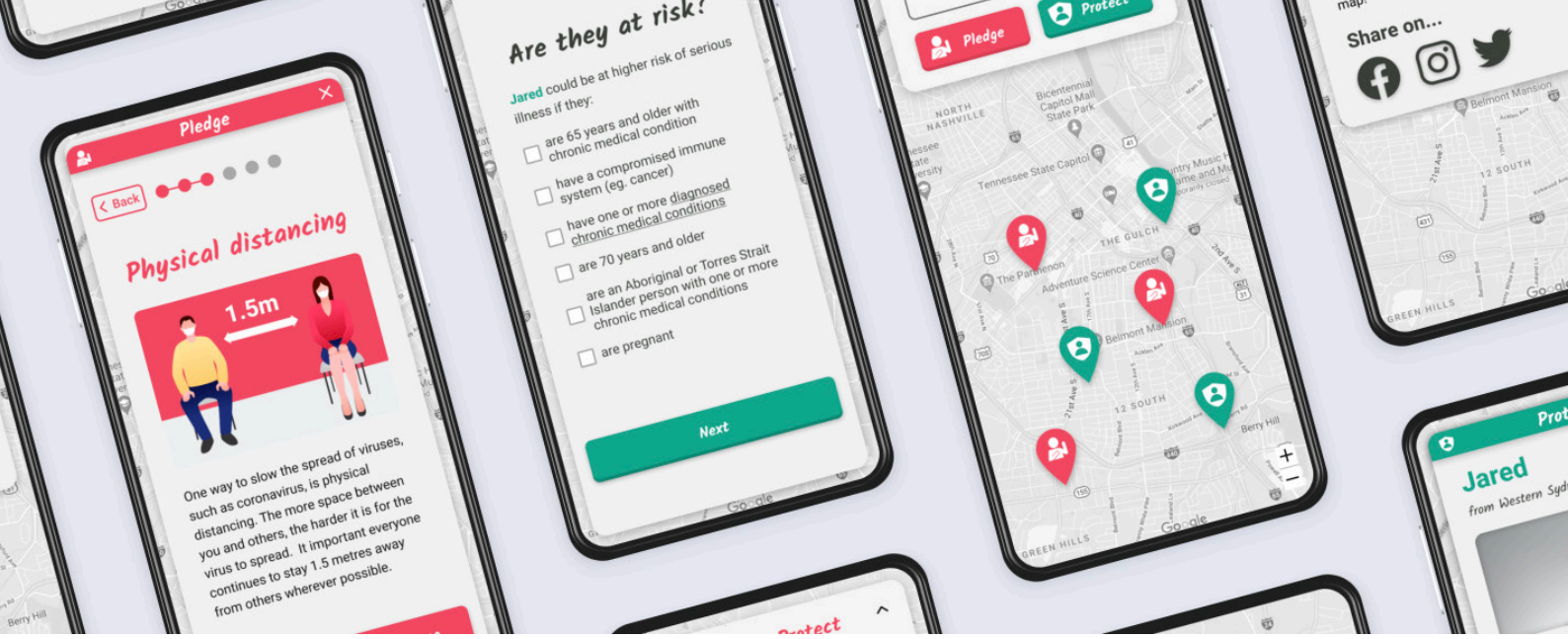
Moderating System

This web app is vulnerable to people misusing the platform for posting irrelevant or harmful content and will need measures in place to combat this. A moderating system is needed for form submissions, to prevent abuse and inappropriate submissions.



Sharing to Social Media

When users click to share to social media, a popup should appear with a personalised link to their created profile so they can directly post to their social media accounts.



Known Issues

Known Issues To Be Tackled:

- As we do not have a database and real user data yet, the pins are currently placed randomly on the screen
- Pins appear in invalid areas, like out at sea or uninhabited areas.
- Vertical scrolling/custom scrollbars not properly implemented yet
- Social media links are not functional
- Input fields in forms do not do anything yet
- Sliding/swiping horizontally to move between form and pages is not implemented yet
- Protect icon on map pins currently display with the bottom corner clipped off; it is not clear what is causing this bug.
- Keyboard navigation does not currently work properly in pop up windows for posts and forms.

Conclusion

Pledge & Protect is a community mapping of vulnerable people that need to be protected from covid-related complications and people who pledge to practice COVID-safe behaviours.

The design process of Pledge & Protect was based on the Design Council Double Diamond Framework. This framework allowed us to thoroughly research the problem of misinformation before defining our problem space and target user needs. Our final problem statement is, “how might we encourage young people to be more accountable with COVID-safe behaviours during this pandemic?”. Our ideation process involved exploring numerous potential solutions before settling on one concept - Pledge & Protect. An iterative design process was employed to develop our Pledge & Protect prototype from its initial early concept to a high-fidelity prototype.

The final result is an interactive web app with a responsive design so users can experience on all devices, including smartphones, tablets, laptop and computers. While th design effectively meets our problem space and user needs, there is still ample room of design improvements and a range of development issues to tackle.

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Appendix A - Research Plan

Problem Area

18-35-year-olds have the highest rate of COVID-19 infections. In addition, new articles and literature reviews revealed that young people are more likely to ignore warnings about COVID-19 and recommendations for COVID-safe behaviours. While they are less likely to fall seriously sick or die, they are very likely to pass on the virus to the vulnerable populace of their society.

Research Objective

The goal of our research is to examine young people's understandings, perspectives and desires in regard to participating in covid-safe behaviours. Through this, we aim to create a digital solution which helps make young people aware of and accountable for their covid-safe behaviours to themselves, others, community and the spread of COVID-19.

Research Questions

The following research questions were created to guide our research process:

1. What motivates young people to practice covid-safe behaviours?
2. What influences young people to action or not action covid-safe behaviours?
3. What is our users' current satisfaction with their performance?
4. How do young Australians perceive the impact of covid-safe behaviours?
5. What are people's current habits and routine concerning covid-safe behaviours? Is it effective? Why or why not?
6. How do young people access their information about covid-safe behaviours?

Primary Data Collection Methods

- 12 Interviews
- 50 Surveys

Analysis Plan

- Thematic Analysis of Interviews
- Data Analysis of Surveys: Quantitative Data Analysis (Quantitative Data) and Affinity Diagram for (Qualitative Data)

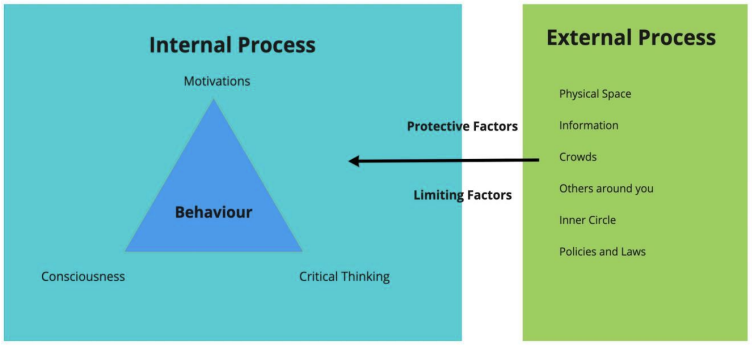
Appendix B - Thematic Analysis

Young people's physical distance behaviours can be separated into habits to build and make routine adjustments.

These behaviours were influenced by three main internal processes:

- Motivations to physical distancing
- Consciousness of self, surroundings and practices
- Critical thinking where you see the importance of physical distancing during difficult situations and experiences

These internal processes can then be affected by external factors both in a limiting or facilitating manner. The external factors are the access of information, physical space, crowds and public spaces, the role of friends and family, other people around you, policies and laws.



Aggravated Dimensions	Themes	Sub-themes
Behaviour	Habit Building	Wearing a mask Maintaining 1.5m Avoiding physical contact Maintaining good hygiene Avoiding touching surfaces
	Routine Adjustment	Avoid transport Avoid places that are harder Avoid crowds Reduce non-essential travels and gathering Stay a home when you can Breaking old habits
Internal Processes	Critical Thinking	Understanding risk Independence in decision-making Inconvenience Internalising social influences Need for socialisation and interaction Feelings of isolation due to physical distancing
	Motivations	For Oneself For Loved ones For the Work Protect Vulnerable Population Duty to Community Flatten the Curve Prevent the return lockdown Stop the Spread
	Consciousness	Consciousness of self and surrounding Overriding natural instinct Physically distance is nothing unusual Forgetfulness as a cause of inaction Physically distancing is a mentally taxing process Guilt as a motivator to stay conscious
External Processes	Physical Space	Narrow physical spaces is a limiting factor Remainders and prompts are useful I Environment can facilitate physical distancing
	Policies and laws	Government should enact tighter laws Workplace practices facilitate physical distancing
	Role from friends and family	Difficult to stop giving physical greetings Difficult to distance family/friends Family/Friend can be Unhelpful Friends/Family can be helpful
	Information	Watching the News Getting information from Family/Friends Getting information from social Media Active finding sources Misinformation
	Crowds and Public Spaces	Crowds limit physical distancing Difficult in essential places Difficult in public transport
	Others around you	Good business practices make it easier to distance Others doing the right thing is good Good social pressure Others being irresponsible makes physical distancing difficult

Appendix C - Personas

Jeff

The Concerned Commuter

- 22
- Western Sydney
- Full-time student
- Living with his parents

Wants & Needs

- He needs to travel to university using public transport.
- Jeff's father is older than 55 and has type 2 diabetes and high blood pressure. Jeff is aware of the risks of COVID-19 to his father so he want to protect himself in order to protect his father..
- Jeff feels like he would do a much better job of staying COVID safe and practising physical distancing if he had more reminders and advice.

Frustrations

- He still needs to get into the habit of physical distancing,but can get too distracted to remember.
- During his commute, he also comes across many people not physically distancing and so forgets about it himself

Jessica

The Social Butterfly

- 28
- North Shore
- Full-time Sephora employee
- Living with her partner

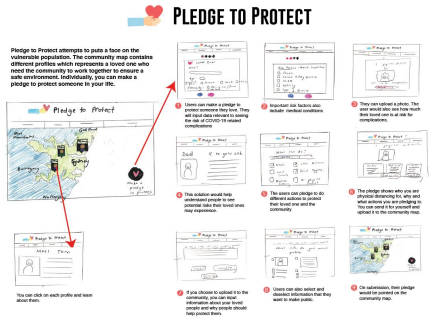
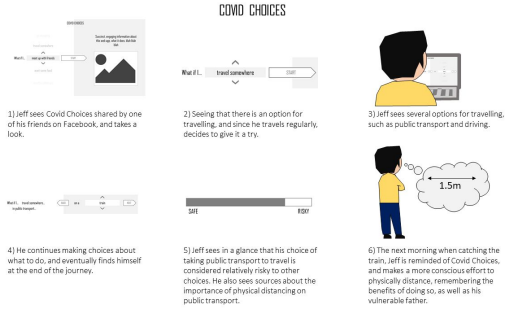
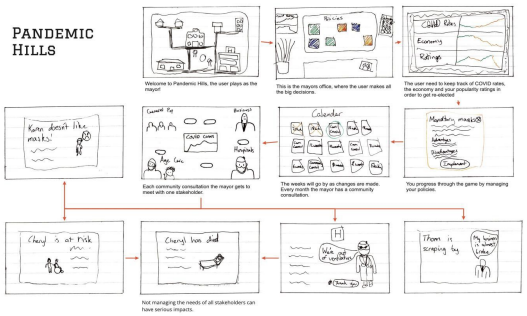
Wants & Needs

- Jessica wants to avoid getting sick as she could potentially spreading it to a lot of people at her workplace and her loved ones.
- She is a social person so she really enjoys meeting up with her family and friends very regularly.
- Jessica gets most of her COVID-19 information from her Facebook news feed

Frustrations

- Jessica struggles being COVID-safe as it doesn't feel normal to her and she needs help to stay motivated
- She finds it difficult to decline social invitations and to physical distance with friends and family
- Jess thinks current COVID resources are really boring and impersonal

Appendix D - Concept Pitch

Concept Art	Concept Description
	Pledge to Protect is a community mapping of vulnerable people in your community. People can make a pledge to protect a loved one, creating a profile for them, inputting their risk factors and what physical distancing practices they pledge to do. The Pledge provides a certificate they can share on social media and becomes an interactive point on a map of your area.
	COVID Choices is an interactive journey through the different choices a user can make across a spectrum of COVID-safe to unsafe behaviours in particular scenarios. Users can choose a starting point and make decisions to proceed on the journey in different ways. When they reach the end of a journey, COVID Choices tells them how relatively risky their choices are.
	Pandemic Hills is a choice-based game in which the user plays as the mayor of a small town. They aim to be mayor for another term, but COVID-19 pandemic has gotten in the way. The user needs to respond well to the pandemic and balance the needs of key stakeholders in their community, from the general population, businesses, aged care, and hospitals.

Appendix E: User Testing Round 4

Appendix E-1: User Testing Protocol

Introduction

- Explain the product and purpose of the test
- Explain that you are testing the product, not the participant.
- Ask permission to record the interview.
- Outline what will be involved in the test:
    1. General Questions
    2. Complete tasks with our prototype where they “think aloud.”
    3. Undergo a semi-structured interview

Pre-test Questions

- Ask the general demographic questions: their occupation, living situations, where they live, age and gender.
- Ask them what they currently use to get information about COVID-19 and being COVID-safe?

Think Aloud Protocol

Prototype: www.figma.com/file/smURJTd7F9xNg37UjLs34u/Wireframes?node-id=106%3A1271

Provide users with the prototype. Instruct your participants to describe the steps that they are taking and express their thoughts and feelings as they engage with the task:

- Task 1- The first impression of the homepage
- Task 2 - View a pledge on the map
- Task 3 - View a protect on the map
- Task 4 - Make a Pledge.
- Task 5 - Add someone to protect

Post-Test: Semi-Structured Interview

- What do you like about the app?
- What don’t you like about the app?
- Do you have any questions about the web app?
- If you had a magic wand, what would you like to change on the add?

Appendix E-2: Participants

Participant	Occupation	Living Situation	Location	Age	Current COVID Resources
User 1	Waitress	Living with family	Western Sydney	21	Google, news articles from Google
User 2	Horticulturist	Living with husband	Newcastle	22	QLD Health, NSW Health, Facebook posts by Gov Health departments
User 3	Software Engineer	Living with wife	Newcastle	25	News websites - ABC News, SBS News, Reuters, BBC. NSW Gov website
User 4	Part-time tutor	Lives with parents	South Sydney	22	Google (for stats), tv news (abc, sbs), whatever is easy to access.
User 5	Student	Lives with parents	Inner City	20	Friends/family (word of mouth), tv (Sky news)

Appendix E-3: Results

Appendix E-3-1: User 1

Think Aloud Protocol

User Goal/Task	Interface Part/Location	Verbal Protocol
First Impression on the Homepage	The map	If you didn't tell me it was about COVID, I wouldn't have known. The sentence in onboarding doesn't make sense. There is a much more straightforward way it can be explained. I first saw the map, because it's there.
View a pledge	Clicked on pledge pin	Hygiene is misspelled. Everyone should be held to this standard, an app shouldn't be necessary. Don't know why I clicked on that
View a protectee	Clicked on protectee pin	Good! It's good to let people know about people that need to be protected. Wasn't expecting the keep Jared safe page. Tried tapping on information accordions. Expect there to be more information on why it is necessary.
Make a pledge	Clicked on make a pledge from protectee pin	I expect you'd be able to type your name. It tells you what to do. It's not hard to work out. Spelling errors on physical distancing and good hygiene. It's information I already know. If it was the beginning of the pandemic and people were unsure of what to do it would be very useful. It's ingrained into people and they're already doing the stuff it asks them to do. I don't see any detriment to it, but I don't see any benefit to it either. It's very easy to use. I would share on social media.
Make a protectee	Clicked on protect button	Thumbs up. Grammatical error on name page. Pretty self explanatory. Says pledge even though it is protect. Can't see people wanting to upload pictures of relatives. Might write something about the person, it's not important to share personal details about a person, but it is important to share why they should be protected. Would share the profile.

Post Test

Questions	Answers
What do you like about the app?	It's easy to use. I like the map, it's useful because it lets you know where people are.
What don't you like about the app?	Don't really understand the intention, purpose or benefit behind it. Why is it useful? Didn't like the spelling errors.
Do you have any questions about the web app?	What is the purpose?
If you had a magic wand, what would you like to change on the app?	I think a more beneficial way of doing it would be to get rid of the pledge system. If they're not going to follow the rules, nothing would make them. With protecting people, having an app where you can find out where the people who need to be protected are located would be good. Maybe have the map centred on the users location. Change the pledge to promise.

Appendix E-3-2: User 2

Think Aloud Protocol

User Goal/Task	Interface Part/Location	Verbal Protocol
First Impression on the Homepage		It's a map. It's got the two colours. Shows people's locations. If you click on pins you'll find out what they're pledging for.
View a pledge	Clicked on pledge pin.	It's a pledge. Connecting with the person looking at the app.
View a protectee	Clicked on Protect button first. Then clicked on protect pin.	Setting out some info about the person who needs to be protected. States his needs or things he has to avoid to stay safe.
Make a pledge	Clicked on pledge button.	Red is a stop colour. It implies you should stop doing this. Should tell you that it's just for first name. Location symbol is good. Like the connected answers [breadcrumbs]. Back button is nicely located. Plenty of space so you don't feel overwhelmed. Handwashing should say for 20 seconds. Give examples of when to use hand sanitiser. Separate washing and sanitiser for readability. Hand looks a bit splodgy. The red draws attention. Put something next to other to tell people to type their own. Done all the links on the preview [breadcrumb]. Make back button work. Privacy disclaimer is quite close to the bottom with little space. Don't like the quotes around Submit in disclaimer.
Make a protectee	Clicked on Protect button	Who would you be protecting? Grandma? Tell us a bit about is listing all the things wrong. Could add personal details. At risk is good idea. Might be better to have pregnant higher up so it's more noticable. Does the map have to be in black and white? It is quite dull.

Post Test

Questions	Answers
What do you like about the app?	It seems friendlier than the government app and is done by own free will. Nice way of lightening up the process. Connecting the community. Like the shadow around the pledge & protect box and markers makes them stand out. Like the shield in the protect icon.
What don't you like about the app?	Nothing to make you think "don't like this". Not sure about the logo font, could be a bit more formal.
Do you have any questions about the web app?	How do you connect people?
If you had a magic wand, what would you like to change on the add?	The pledge & protect box at the top of the home screen is very blah. Could be brighter because the map is quite boring. Could also have a darker shadow for more oomph.

Appendix E-3-3: User 3

Think Aloud Protocol

User Goal/Task	Interface Part/Location	Verbal Protocol
First Impression on the Homepage		Series of red things meaning danger, and green things that are good. Pledge looks maybe like a traffic policeman, actually a person making a pledge.
View a pledge	Click on pledge pin.	Person from that location is making location is making a pledge. Bit confused about pulldown menu, looks like selection box. Could also tell more info.
View a protectee	Click on protect pin.	Person who is particularly vulnerable. Pledge is money related, would quite out of app immediately. On the web pledge is normally donation related. Promise could be used instead.
Make a pledge	Click on make a pledge in protect pin.	Like the dots up the top. Would type in name and postcode. What if I don't want to pledge to an action. Could have links to examples of how to wash hands. Might not want to pledge to everything. Other would allow you to enter text. Would check out submit disclaimer. Would share on Facebook.
Make a protectee	Clicked on protect button.	How general should location be? Upload picture would allow you to edit, crop image.

Post Test

Questions	Answers
What do you like about the app?	Not a lot to tell the truth. Still have big privacy concerns. By making data general, the impact is reduced. Would be fantastic for health professionals, paramedics, employees. General public doesn't need to know that information.
What don't you like about the app?	Red is something you shouldn't.
Do you have any questions about the web app?	The wording of "pledge", seems American
If you had a magic wand, what would you like to change on the add?	Changing red to blue. Would like to get location from device. Could vary location precision to different users. Paramedics get within 50 metres, general user gets within 5 km.

Appendix E-3-4: User 4

Think Aloud Protocol

User Goal/Task	Interface Part/Location	Verbal Protocol
First Impression on the Homepage	Pledge and protect buttons	Wow it looks quite good, I like the colours and stuff, and it's really clear to tell what is what. And I guess these dropdowns would have info on what physical distancing is, and so on.
View a pledge	View pledge	Oh cool, what's this about, so "I, harrison… *reading through the page*" yeah that all makes sense.
View a protectee	View protectee	And this is… *reading through* ohhh I get it, so this is a person that you want to be protecting, yeah
Make a pledge	Pledge button	This is good, I like how easy it is to understand. Those icons and images are really nice, too.
Make a protectee	Protect button	Yeah, this is great, colour choice is really nice, too. *Reading through screens* Yep, yep, this all makes sense. I like the share buttons at the end, that's cool.

Post Test

Questions	Answers
What do you like about the app?	Easy to use, instructions are nice and succinct, aesthetics really fit into it and makes it easier to understand. I really like how the map is in greyscale and the pledge/protect are in colour, it highlights the important parts and reduces clutter
What don't you like about the app?	I don't know to be honest, I feel like this isn't a bad thing, but it needs more purpose to the app than just spreading awareness, not sure what it is but I feel like it could be more multi-purpose… like google maps for example, with this app I feel like once covid is over I'd never touch it again.
Do you have any questions about the web app?	What are the other things you would actually implement in this in the long run? What about people putting in dud information?
If you had a magic wand, what would you like to change on the add?	I dont think I'd change anything… it serves it's purpose so it's fine.

Appendix E-3-5: User 5

Think Aloud Protocol

User Goal/Task	Interface Part/Location	Verbal Protocol
First Impression on the Homepage	Home page	I like the icons, they make a lot of sense
View a pledge	View pledge	Yep, that all makes sense
View a protectee	View protectee	Okay, so thats what it is I don't think the remove button (photo) should be red
Make a pledge	Make pledge	It's good that it has a start page first, so I know I'm about to start a form or something
Make a protectee	Make protectee	Yep, this looks good, it's nice that I can share it too

Post Test

Questions	Answers
What do you like about the app?	I like how its intuitive to use and understand
What don't you like about the app?	I'm just nit-picking, but I think maybe there could be a way to allow us to view info on covid safe behaviour without having to go through the pledge form, although I guess that would kind of defeat the purpose of the app.
Do you have any questions about the web app?	No, I was a little confused on the view protect thing, but it made sense once I looked at the pledge and protect forms.
If you had a magic wand, what would you like to change on the add?	Maybe some of the colours, but then again I don't know if they would actually look good changed without changing it first.

Appendix F: Heuristics Evaluations

Appendix F-1: Evaluator 1

Evaluator: Ebony
Role: Design Computing Student
Date: 3/11/2020
Website/App: Pledge & Protect
Device: Mobile

Browser: Google Chrome
Tasks: Complete onboarding process, Interact with the map, View a pledge, View a protect, Make a pledge and Make a pledge

Severity Scale
0 - I don't agree that this is a usability problem at all
1 - Cosmetic problem only: need not be fixed unless extra time is available on the project
2 - Minor usability problem: fixing this should be given low priority
3 - Major usability problem: important to fix so should be given high priority
4 - Usability catastrophe: imperative to fix this before the product can be released

Heuristics	Severity	Issues	Recommendation
1. Visibility of system status	N/A		
2. Match between system and the real world	1	Normally, you expect to be able to log-in to view your profile and update things	Might not be feasible right now but add in log-in for future steps
3. User control and freedom	1	Search function Restricted to one area Having to go click back until you get to the page you want to edit it	Add search bar Allow users to go to other areas Being able to edit profiles without having to go through the whole process again
4. Consistency and standards	0	None. Iconography and colour choices make it easy to understand	
5. Error prevention	N/A		
6. Recognition rather than recall	N/A		
7. Flexibility and efficiency of use	1	No flexibility for frequent users	Add shortcuts before you open the app
8. Aesthetic and minimalist design	0		
9. Help users recognize, diagnose, and recover from errors	N/A		
10. Help and documentation	N/A		

Appendix F-2: Evaluator 2

Evaluator: Rey
Role: Design Computing Student
Date: 3/11/2020
Website/App: Pledge & Protect
Device: Mobile

Browser: Google Chrome
Tasks: Complete onboarding process, Interact with the map, View a pledge, View a protect, Make a pledge and Make a pledge

Severity Scale
0 - I don't agree that this is a usability problem at all
1 - Cosmetic problem only: need not be fixed unless extra time is available on the project
2 - Minor usability problem: fixing this should be given low priority
3 - Major usability problem: important to fix so should be given high priority
4 - Usability catastrophe: imperative to fix this before the product can be released

Heuristics	Severity	Issues	Recommendation
1. Visibility of system status	0		
2. Match between system and the real world	1	Instinctively will like swiping to get to the next page	Along with next/back buttons allow users to swipe across screens
3. User control and freedom	1	Lack of tasks to do and content to add	Think about videos to make it more personal and people recording themselves carrying out their pledge
4. Consistency and standards	0		
5. Error prevention	0		
6. Recognition rather than recall	0		
7. Flexibility and efficiency of use	N/A		
8. Aesthetic and minimalist design	0	None- like the design and simplicity	
9. Help users recognize, diagnose, and recover from errors	N/A		
10. Help and documentation	0		

Appendix F-3: Evaluator 3

Evaluator: Harrison
Role: Designer & Developer
Date: 3/11/2020
Website/App: Pledge & Protect
Device: Mobile

Browser: Google Chrome
Tasks: Complete onboarding process, Interact with the map, View a pledge, View a protect, Make a pledge and Make a pledge

Severity Scale
0 - I don't agree that this is a usability problem at all
1 - Cosmetic problem only: need not be fixed unless extra time is available on the project
2 - Minor usability problem: fixing this should be given low priority
3 - Major usability problem: important to fix so should be given high priority
4 - Usability catastrophe: imperative to fix this before the product can be released

Heuristics	Severity	Issues	Recommendation
1. Visibility of system status	0		Form flows are straight forward
2. Match between system and the real world	0		
3. User control and freedom	2	Tapping on small x is not intuitive on mobile	Increase the size of exit symbols
4. Consistency and standards	2	Back button placement Top Bar	Make back and next buttons all in the same place Increase the size of the top bar
5. Error prevention	0		
6. Recognition rather than recall	0		Interface patterns meet standards
7. Flexibility and efficiency of use	1	Expect to be able to swipe on onboarding pages	Add swipe function
8. Aesthetic and minimalist design	2	"What's this about" looks like an input field Pledge pages are very empty	Modify button Populate page
9. Help users recognize, diagnose, and recover from errors	2	Back button placement	Make back and next buttons all in the same place
10. Help and documentation	2	Onboarding button doesn't make it clear it is help	

Appendix G: Affinity Diagram