

## **Social Ease: A Socially Assistive Device**

## **Prospective User**

Menna is an 88-year-old woman, recently widowed, with two children, four grandchildren and two great-grandchildren. Menna lives in a ground floor apartment in a retirement complex in a Somerset town, which she moved into to assist her husband when he was unwell. Menna was the primary caregiver for her husband, and since his passing she does not like to be alone in the flat and often puts on the television or radio to make her feel more at home. Menna has various health issues, including arthritis in her hands which can make operating technologies painful, especially if they include fine movements or buttons. She has minor hearing loss so often needs to use her devices on a high volume or with subtitles, but she does not require hearing aids. Menna is longsighted, requiring lenses for close tasks like reading and when using small electronic devices like mobile phones, but her vision is good otherwise. Menna has a clear idea of what her home should look like and has kept up a modern aesthetic, often buying new kitchen gadgets. Menna is interested in technology for entertainment, and uses an MP3 Player, Kindle and Sky TV. However, Menna has often been frustrated with computers due to their complexity and wide-ranging functionality. Previously, Menna's husband would use the computer to catch up with old friends and keep Menna updated, so when he died it became more difficult for Menna to stay in contact with her friends. Her son set up an iPad which she uses occasionally, but she is frequently frustrated by adverts or irrelevant material and has inadvertently locked herself out of many accounts after forgetting her passwords.

## **User Requirements**

Considering this prospective user, a device that could assist them would be one that collates their social updates into an accessible interface which is easier to use than traditional applications and blocks irrelevant content. Physically, the device could integrate a lightweight design to ensure usability and aid individuals with limited dexterity, such as those suffering with arthritis. From this initial idea, several user requirements can be developed.

## **Functional Requirements**

- Allow the user to see or hear a summary of their social updates created using Artificial Intelligence (AI).
- Allow the user to respond to social media posts on a simple user interface (UI) which blocks irrelevant content and advertisements.
- Allow the user to securely access passwords for their accounts.
- Allow the user to easily manoeuvre the device, weighing under 500 grams.

## **Non-Functional Requirements**

- The system should perform quickly, with the AI summary updating in real-time, and all other windows opening instantly to provide immediate feedback for the user.
- The system must be compatible with a range of platforms and operating systems so that contacts and social updates can be accessed.
- The device is portable and can last on battery power for at least 12 hours so the user can use the device in a more comfortable location for most of the day.
- The device must be reliable so as not to confuse users with unexpected crashes.

## Feature Prioritisation

Specific features were identified based on these user requirements, and were prioritised using the MoSCoW model (*Benyon, 2013*), as shown in Table 1.

*Table 1: Feature Prioritisation using MoSCoW Model*

<b>Must</b>	Provide AI-powered social summaries.	Provide a basic interactive interface.	Be easily held and manoeuvrable.	Assist with password storage.
<b>Should</b>	Include a speak-aloud function.	Be Freestanding.	Have adjustable brightness and volume.	
<b>Could</b>	Have a magnetic charger cable for ease of use.	Have an integrated foldable stand.	Show the time.	
<b>Want</b>	Video Call Function.	Rapid emergency call function.	AI-powered video call suggestions.	Have option to change the background.

## Prioritisation Justification

The features in the “Must” category are completely essential for the device. For example, without the AI-powered social summaries and simplified interface, the device would be scarcely different from traditional social media applications and thus would be of no benefit to the user. The device must also be easily manoeuvrable otherwise it risks being

inappropriate for many older people. The features in the “Should” category are important, but not integral to the function of the device. For example, the speak-aloud function is useful for those with reading difficulties and is a relatively easy feature to incorporate, but the prospective user can read with corrective lenses if needed. Those in the “Could” category would be appealing to the user and provide additional functionality but can be omitted if required. For example, the magnetic charger cable eases use for those with mobility issues like arthritis, but users may also be comfortable with a traditional charging port as this is something they encounter in most other devices. Finally, features in the “Want” category are those which could be beneficial for the user, but are likely to be omitted in favour of simplicity. For example, a video call function would allow the user to easily speak with their contacts, making the device a centralised locus for social contact, but this function is already present in other devices and may overcomplicate the UI.

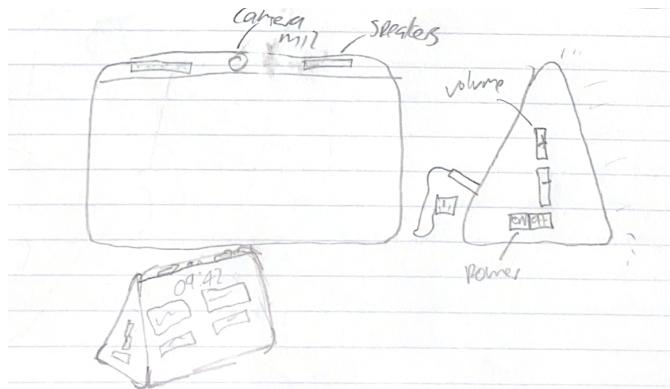
## Prototype

This section provides prototypes of both the physical structure and UI of the device that has been designed to address the user requirements. The device is called ‘Social Ease’ and aims to provide an easy way for older users to access social updates and passwords.

### First Iteration

The first iteration of Social Ease was in the form of sketches to conceptualise a possible design based on the features in Table 1. Figures 1 and 2 show these sketches.

*Figure 1: First Iteration of the Casing of Social Ease*



*Figure 2: First Iteration of the User Interface of Social Ease*

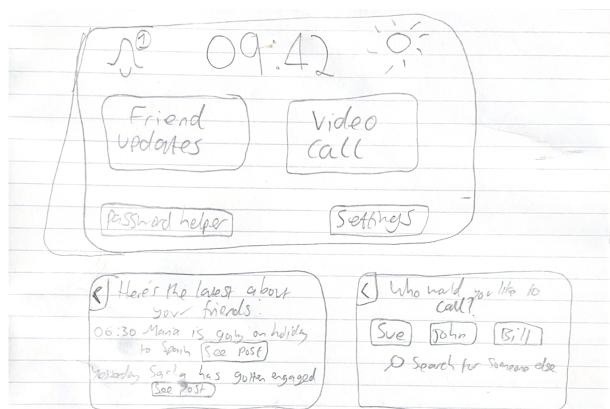


Table 2 demonstrates the feedback and possible solutions of this design which will inform the following iterations.

*Table 2: First iteration feedback and solutions*

## Feedback from Prospective User

Casing lacks manoeuvrability.

The exact functions of the device are unclear.

Weather function is not relevant to the requirements.

## Solutions for next iteration

A slimmer and lighter casing for the device.

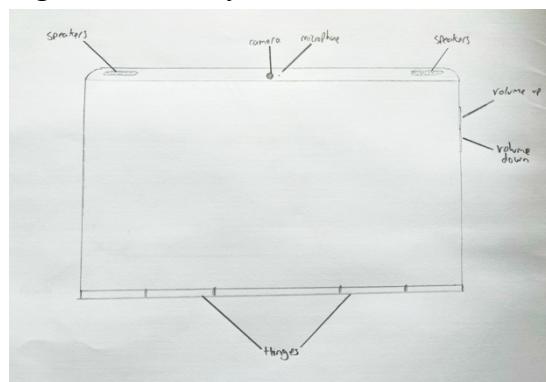
A more detailed UI design.

This will be replaced with a more useful feature from Table 1.

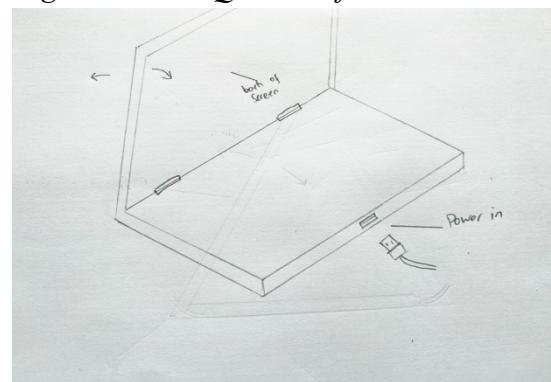
## Second Iteration

Building upon the feedback from the first iteration, the following design was created.

*Figure 3: Front of Device, Second Iteration*



*Figure 4: Rear Quarter of Device, Second Iteration*



*Figure 5: User Interface, Second Iteration*



Several further limitations emerged from this design, largely stemming from overcomplication of the interface. These are shown in Table 3.

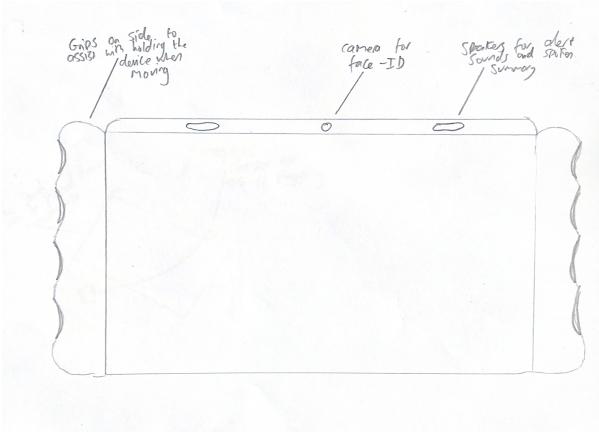
*Table 3: Second iteration feedback and solutions*

<b>Feedback from Prospective User</b>	<b>Solutions for next iteration</b>
UI has too many features, compromising the simplicity of the interface.	Simplify UI by focusing on the most essential functions in Table 1.
Buttons can be difficult to use for those with arthritis.	Remove buttons and make the device fully functional by touch.
Difficult to hold the device without touching screen.	Add grips to the physical design to aid with holding the device.
The symbols used with the sliders in settings are identical across parameters, increasing the likelihood of an action-based slip (Norman, 2013).	Replace symbols with relevant skeuomorphs that are more intuitive to interpret.
Colourful background is distracting.	Replace the background with a neutral shade.
Emergency function would likely be redundant in a true emergency.	Remove emergency function to enhance simplicity.

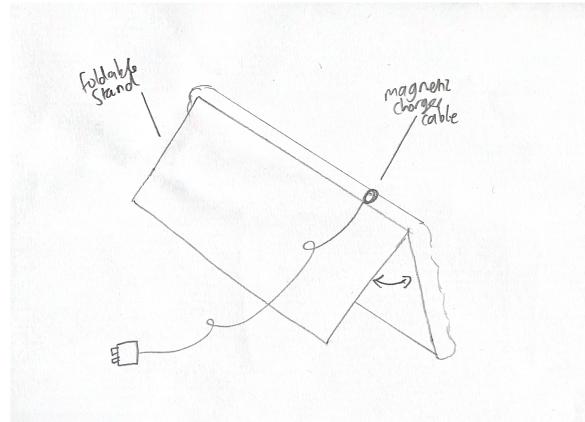
## Final Prototype

The final prototype addresses the feedback and prioritises the most important features to ensure simplicity. Figures 6 and 7 are sketches of the physical casing of Social Ease.

*Figure 6: Front View of Device*



*Figure 7: Rear Quarter of Device*



Social Ease can be used whilst resting on a surface using the stand, but it is slim and lightweight to afford manoeuvrability. The grips on either side are designed to make the device easy to carry for those with mobility problems - an ergonomic design similarly employed by many handheld gaming devices (e.g., Figure A1 in the Appendix). The grooves on the grips both aid with handling and act as signifiers (Norman, 2013) to indicate where to hold the device. The absence of buttons maximises accessibility for those who struggle to activate them. Instead, the device is fully functional by touch. The power port on the top edge is magnetic which affords very easy attachment and removal for those with mobility issues. One potential limitation to consider is that the location of the port may not be clear to the user. Traditional ports represent both an affordance (they afford insertion of a cable) and a signifier (the port itself signifies where the cable should be inserted). The absence of a port in this design means that the feature lacks clarity on where to attach the cable. In this case, accessibility was prioritised, but this could be adapted based on user feedback.

Figure 8 shows the full UI of Social Ease. By reducing the number of windows from seven to four, simplicity of the UI was maximised.

Figure 8: UI of Social Ease

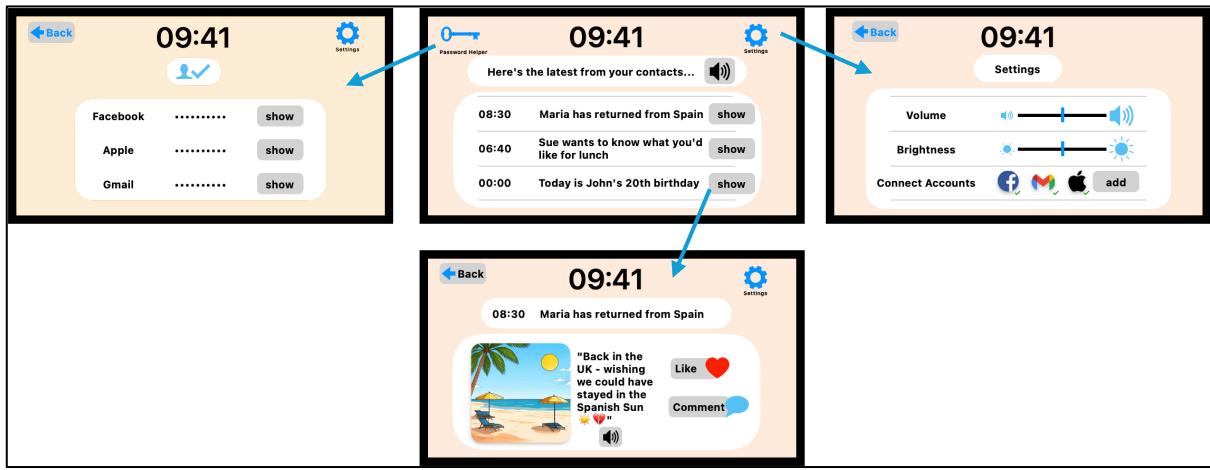
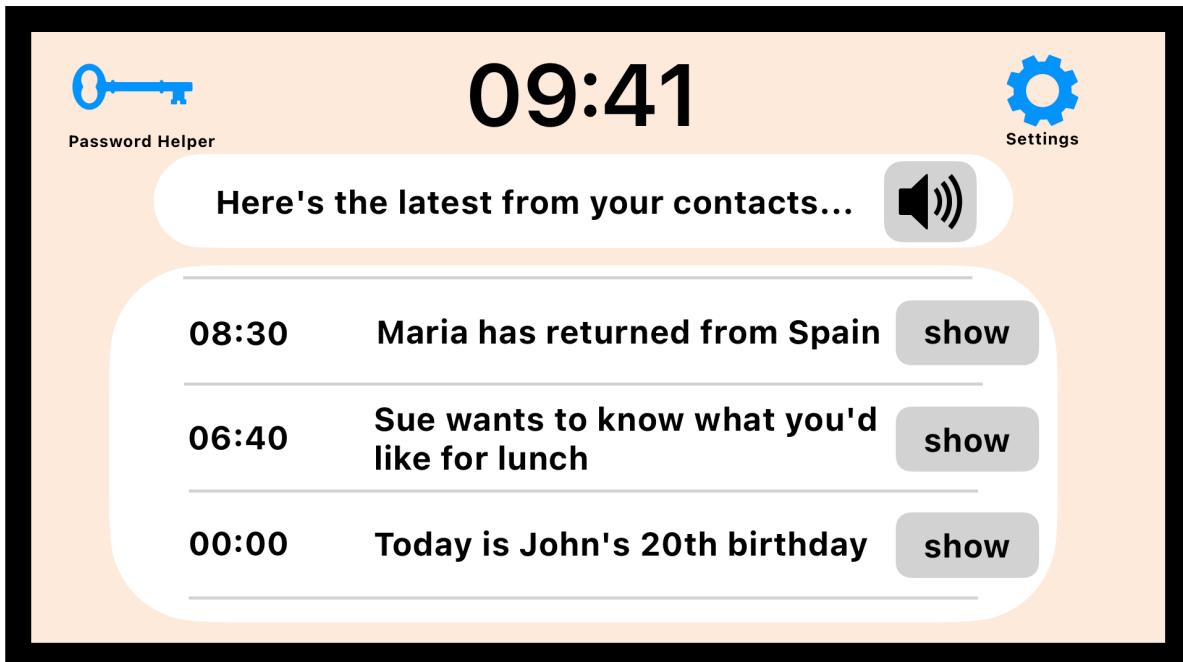


Figure 9 is the default window of the device which automatically updates so the user can access an immediate summary.

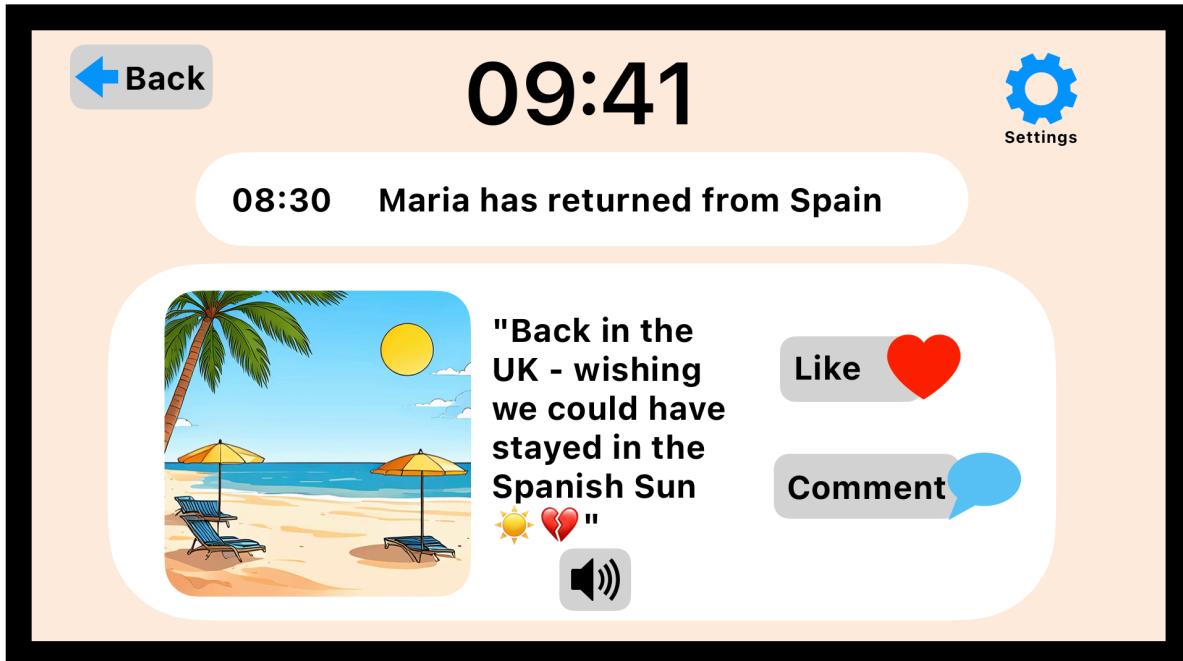
*Figure 9: The Default Window of the Interface.*



The interface icons are skeuomorphic (see Norman, 2013; Chan, 2024), meaning they apply familiar ideas to a new technology or context. For example, the user can easily interpret the key icon in the upper-left corner as being related to security, which makes it relevant to the “Password Helper” feature. The shading of the “show” button allows it to stand out from the white backing, which is an example of the figure-ground Gestalt principle (Koffka, 1935).

Tapping “show” opens an interface that contains further details of the corresponding update, as shown in Figure 10.

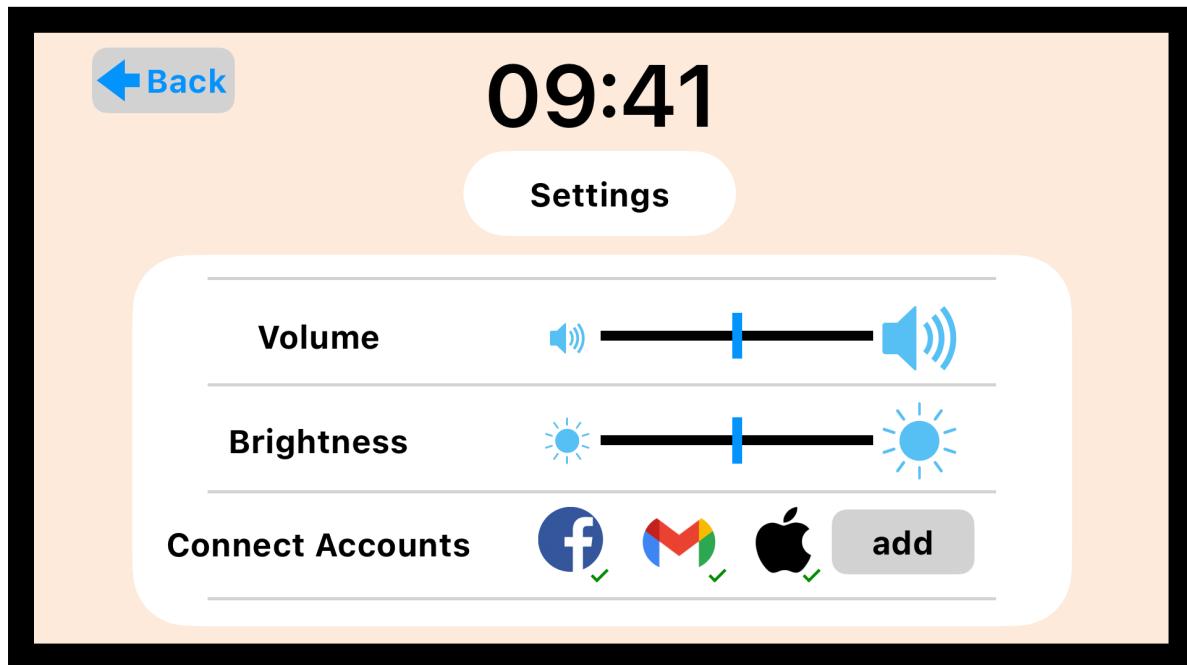
*Figure 10: Window shown when user selects a specific update*



The user can access simple social responses and can also have the caption read aloud; all these features are represented by relevant skeuomorphs. Social Ease blocks any irrelevant content or advertisements that would be present if the user was using the source application.

The “Settings” window is shown in Figure 11.

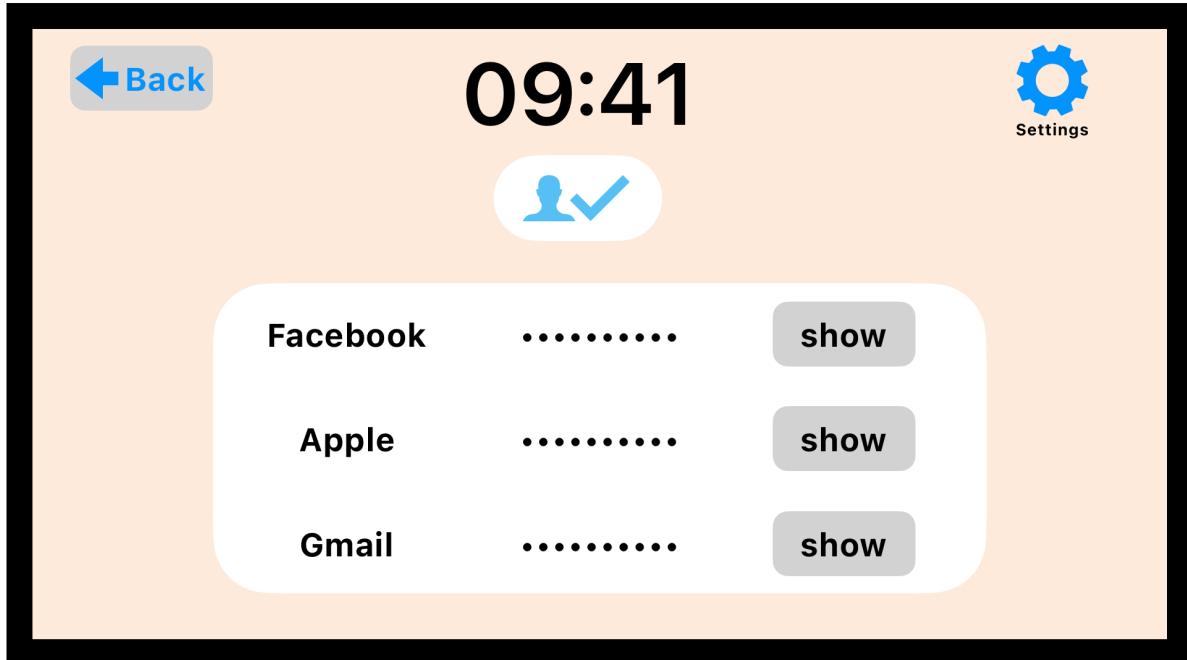
Figure 11: Settings



In this iteration, the use of skeuomorphs with the sliders allow the functions to be instantly identified. For example, it is intuitive that the small sun icon represents a lower brightness than the larger one. To further enhance differentiation, grey lines were placed above and below each parameter to separate them. This makes use of the Gestalt principal of closure (Koffka, 1935), as the regions appear separate even though the dividing lines do not reach the edges. The user may require assistance in connecting accounts as they might need to accept permissions on a parallel device, which some users could find complicated.

Finally, the “Password Helper” window is shown in Figure 12.

Figure 12: Password Helper



The device uses face identification to confirm the user’s identity, and then they can view the passwords of their connected accounts.

## **Scenarios For Use**

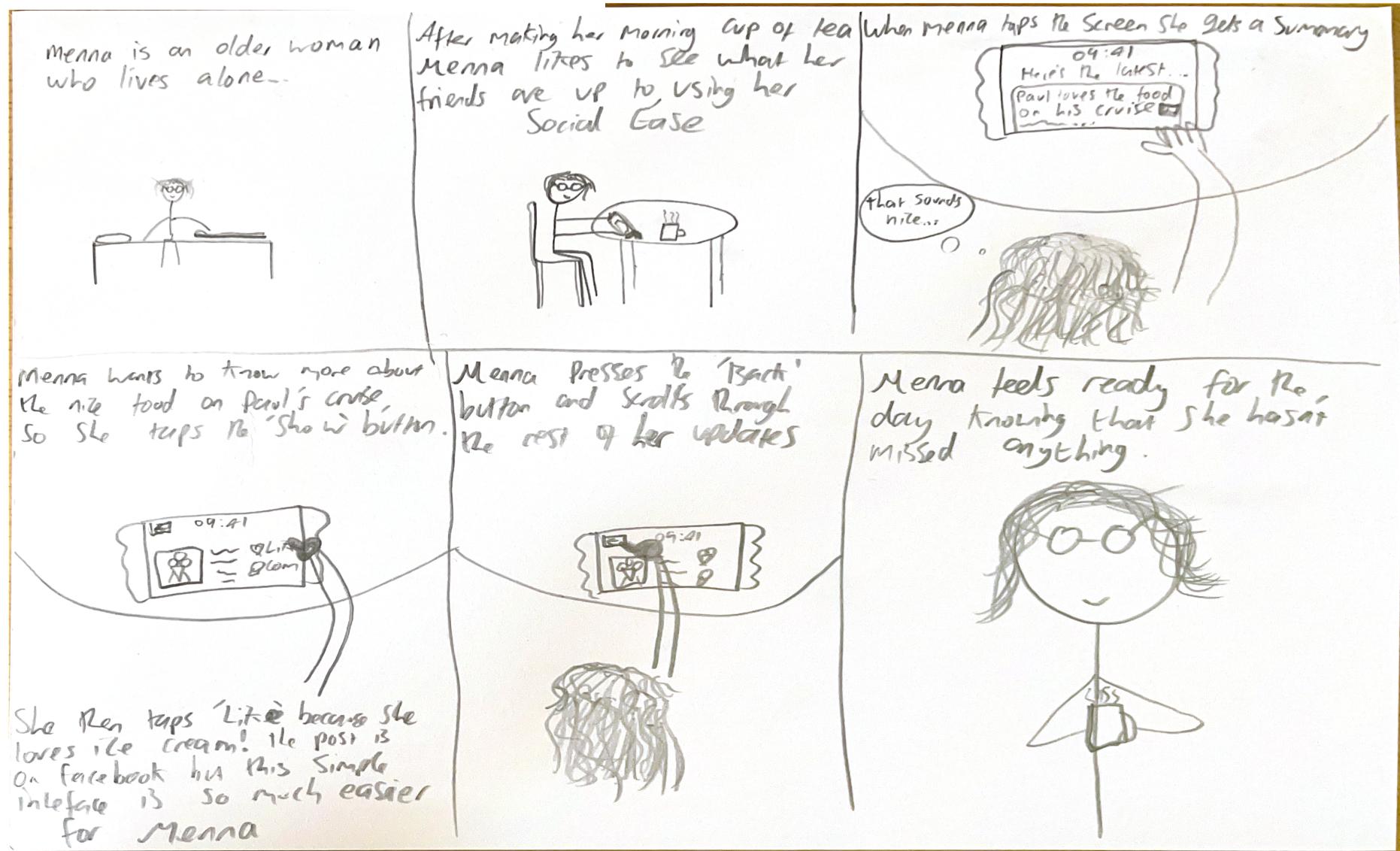
### **Scenario 1**

Menna usually gets tired by 10pm and likes to use the read-aloud function on her Social Ease before she sleeps, as this is easier on her eyes. Menna moves the Social Ease from her living room to her bedroom for this. First, she removes the magnetic port from the top of the device. Menna's arthritis can make this painful on some devices, but with the Social Ease she simply pushes her palm against the port and the cable slides off with ease. Menna then picks up the Social Ease with the assistance of the grips and moves it to her bedside table. Once in bed, Menna taps the speaker icon on the home page and the Social Ease reads her updates aloud to her. "Here's what you missed since your last update" the device begins. "Pauline is returning from her cruise tomorrow; she is docking in Southampton in the early hours. Also, Bella has been discharged from hospital and would like to meet up this week. Finally, Simon says thanks for having him visit today, he says your Social Ease is a cool piece of tech".

### **Scenario 2**

Figure 13 is a storyboard illustrating another possible use-case scenario of Social Ease.

Figure 13: Storyboard





## Appendix

Figure A1: Valve Steam Deck Handheld Gaming Device



(2024). *Steam Deck OLED: Limited Edition White - Launching Worldwide Next Week* [Review of *Steam Deck OLED: Limited Edition White - Launching Worldwide Next Week*]. <https://store.steampowered.com/news/app/1675200/view/4472731215261073464>

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