Heuristic Evaluation – Safe Zone App – University of Glasgow

Group 3 – Lab 10 am

Group Members:

Jiaxin Cheng – 2973117C**,** Mingze Gao – 2969378G**,** Gloris Denisse Cedeno – 3006048C**,** Wencheng Shi – 2976762S**,** Yang Song – 2981903S**,** Yaohui Han – 2961240H.

Product Description

SafeZone is a mobile application designed to enhance student safety and monitor university attendance. It allows students to record their presence on campus and provides instant access to emergency assistance.

The app's main purpose is to be an emergency response system for immediate contact with campus security. If the emergency button is triggered accidentally, security personnel will follow up to confirm the user's safety.

The app is essential for student visa holders, ensuring compliance with attendance policies. It is worth mentioning this is a second purpose recently added to the app. The usage mode is pressing the Check-In function at the start of each class; with this action, students help universities track engagement. Attendance records are securely stored and reviewed to identify potential issues and offer support. Failure to check-in may result in university intervention or even academic consequences.

While SafeZone is essential for student safety, engagement tracking, and regulatory compliance, some design flaws were observed during use and will be evaluated in this heuristic analysis.

Fig 1. Main Intef. IOS

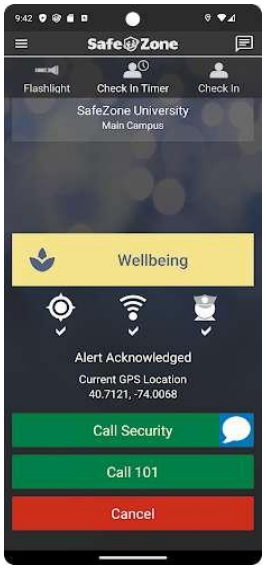

Fig 2. Main Interf. Android

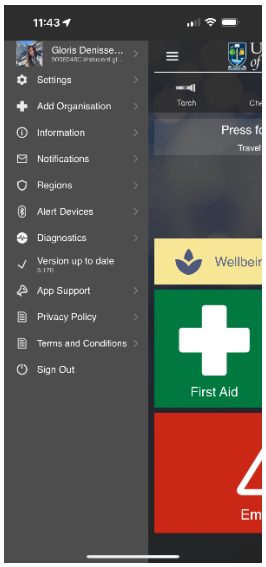

Fig 3. Menu IOS

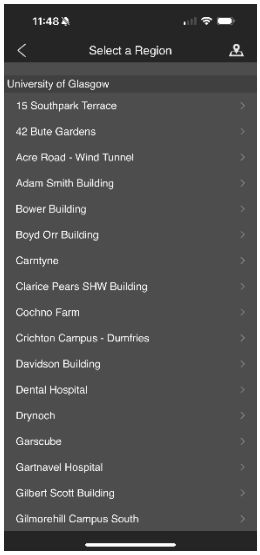

Fig 4. Regions Page IOS

Master List of Usability issues

Usability Issue	Heuristic	Evaluator(s)	Description
Lack of search function	Recognition Rather Than Recall	Jiaxin Cheng	No search icon (e.g., magnifying glass) makes finding features difficult.

Overly Complex Menu	Recognition Rather Than Recall	Jiaxin Cheng	Confusing options (e.g., “User application support” leading to “Help” window).
Notifications hidden	Visibility of System Status	J. Cheng, Y. Han	Alerts do not appear on the main interface, requiring manual checks.
No exit button in functions	User Control & Freedom	Jiaxin Cheng	No way to cancel accidental emergency/help presses; must wait for staff response.
No shortcut for help requests	Flexibility & Efficiency	Jiaxin Cheng	No quick-action (e.g., long-press menu) to request help outside the app.
Misleading “Check-in Timer”	Match w/ Real World	G. D. C. Batista, W. Shi, M. Gao, Y. Song	Appears as reminder but auto-calls emergency services when time expires.
Small Timer Setup Window	User Control & Freedom	G. D. C. Batista	Hard to use, unsuitable for emergencies, lacks accessibility features.
Alert Devices Page Lacks Info	Help & Documentation	G. D. C. Batista	No list of compatible alert devices or setup instructions.
No Clear Check-In Feedback	Visibility of System Status	Wencheng Shi	“Check In” changes to “Check Out” but lacks confirmation feedback.
Accidental Emergency Activation	Error Prevention	Wencheng Shi	Large emergency button is easy to trigger accidentally.
Android Check-In Issues	Error Prevention	Wencheng Shi	Some Android models fail to grant location permissions, preventing check-in.
Excessive Permission Requests	User Control & Freedom	Wencheng Shi	Requires constant location/Bluetooth access, raising privacy concerns.
Minimal UI & Poor Onboarding	Aesthetic & Minimalist Design	Wencheng Shi	No in-app guidance, forcing reliance on external documentation.
Missed Check-Ins	Visibility of System Status	Yang Song	Not linked to class schedules; no lock screen reminders.
Translation Issue (“Enquiry”)	Match w/ Real World	Yang Song	“Enquiry” is not translated in the Chinese version.
Cancel Button Overwrites Check-In	Recognition Rather Than Recall	Yang Song	“Cancel” replaces “Check-In” button, making countdown cancellation confusing.
Unclear Flashlight Function	Aesthetic & Minimalist Design	Y. Song, M. Gao	No clear purpose for flashlight button within the app.
Users Forget to Check-Out	Error Prevention	Mingze Gao	No reminders: users realize too late they are outside check-in range.
No Location Search Function	User Control & Freedom	Mingze Gao	Users must scroll to find locations; no search function.
Language Setting Tied to System	Flexibility & Efficiency	Mingze Gao	App language follows system settings; cannot be adjusted independently.
Lack of Accessibility Features	Aesthetic & Minimalist Design	Yaohui Han	No screen reader support, contrast settings, or text size customization.

Diagram

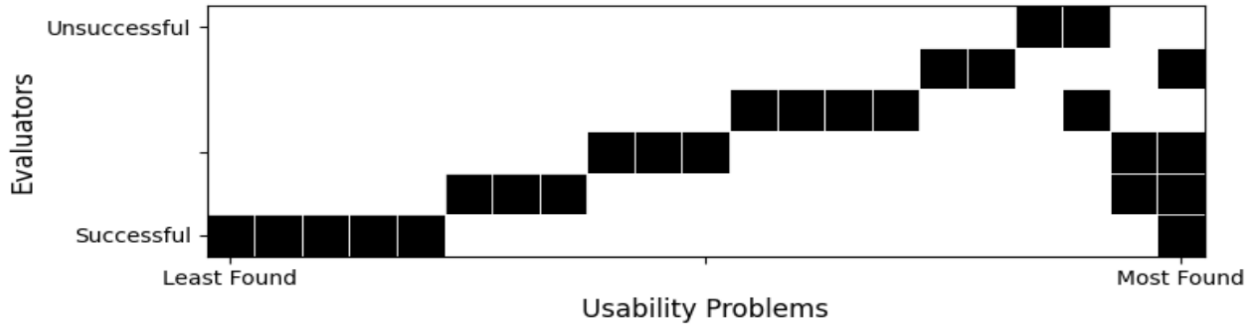

Fig 5. Usability Problems Diagram

Commentary

To assess the app's usability, an evaluation chart was created that prioritizes issues based on the number of evaluators who identified each problem using the Usability Problems Diagram (Fig. 5) and the heuristic principles related to each of those problems. The issues were then scaled from 0 (worst) to 10 (best). This method enables ranking of the problems identified and focuses on those with the greatest impact on user safety and overall usability.

The misleading "Check-in Timer" ranked as the highest priority, receiving a score of 2 out of 10. This is a critical issue because it can confuse users in emergencies. The recommendation is renaming it to "Emergency Timer" and providing clear warnings to enhance safety.

Next, we identified Error Prevention issues, such as accidental emergency activation and missed check-outs, which scored 3 out of 10. Implementing confirmation dialogs and automatic reminders would help alleviate these problems.

The User Control and Freedom heuristic has a score of 4 out of 10, revealing issues like the absence of exit buttons and a confusing "Cancel" function. Adding clear exit and cancel buttons, along with language settings, would improve user control. Other concerns, such as the lack of a search function, check-in history, and links to class schedules, also scored 4 out of 10. These could be solved by incorporating more intuitive navigation features.

Heuristic Principle	Issues	Severity (10 = Best)	Recommendations
1. Visibility of System Status	Notifications are unclear, no feedback after actions.	**6/10**	Improve notification visibility, and add animations/audio cues.
2. Match Between System and the Real World	“Check-in timer” label is misleading.	**2/10**	Rename to "Emergency Timer" with clear warnings.
3. User Control and Freedom	No “Exit” button; Cancel button replaces check-in; No language settings.	**4/10**	Add exit/cancel buttons, keep functions visible, and allow in-app language selection.
4. Consistency and Standards	"Enquiry" is not translated into Chinese version.	**6/10**	Ensure full UI localization with testing.
5. Error Prevention	Accidental emergency activation: Users forget check-out.	**3/10**	Add confirmation dialogs; Implement GPS-based auto check-out or reminders.
6. Recognition Rather than Recall	No search function; No check-in history; No class schedule link.	**4/10**	Add a search bar, check-in history, and calendar sync.
7. Flexibility and Efficiency of Use	No quick emergency access; Security features are hard to use.	**4/10**	Implement long-press gestures, pull-down menus, and clearer guidance.
8. Aesthetic and Minimalist Design	Poor onboarding; Flashlight function redundant; Lacks accessibility.	**6/10**	Add tutorials, remove redundant features, and improve accessibility options.
9. Help Users Recognize, Diagnose, and Recover from Errors	No clear check-in feedback.	**8/10**	Add pop-ups, sound cues, and a check-in log.
10. Help and Documentation	Android compatibility issues; Excessive permission requests.	**4/10**	Optimize permissions, add troubleshooting guides, and improve FAQs.

Fig 6. Evaluation Chart – Heuristic Analysis: Safe Zone App

This evaluation process prioritizes the most severe usability issues and provides targeted recommendations. By focusing on crucial safety and usability concerns, the overall user experience can be enhanced while still addressing less urgent improvements.

Evaluator: Jiaxin Cheng

Usability Heuristics for User Interface Design	Usibility problems
6: Recognition Rather than Recall Minimize the user's memory load by making elements, actions, and options visible. The user should not have to remember information from one part of the interface to another. Information required to use the design (e.g. field labels or menu items) should be visible or easily retrievable when needed.	There is no interface or window for users to retrieve the key words or functions in SafeZone app. Especially when users open this app, there is no search icon like a magnifying glass. This point affected the speed to find the specific functions which are needed by users. At the same time, the menu of SafeZone app is also too complex. For example, when people pressed the button of "User application support", the "help" show in front of people which is confusing.
1: Visibility of System Status The design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.	The notification button is under the menu which is not obvious in SafeZone app, and the notification cannot appear on the main interface to remind users. Users cannot be informed about what is going on if they don't open the menu and open notification specifically.
3: User Control and Freedom Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.	There is no "exit" button in most function interfaces in SafeZone app, when people accidentally pressed emergency or help, they cannot cancel them or exit by themselves. Rather, they need wait until the stuff telephone them.
7: Flexibility and Efficiency of Use Shortcuts — hidden from novice users — may speed up the interaction for the expert user so that the design can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.	In SafeZone app, there is no shortcuts for users to ask for help quickly. For example, there is no pull-down menu when people press the application icon for a long time. If people could ask for help by pressing the icon and they needn't open this app, the speed will be quicker, and the effect will be higher.

Evaluator: Gloris Denisse Cedeno Batista

Check In Timer – Principal Menu

The button “check in timer” does not clearly state its real function, it transmits it’s an “alarm” or timer to remember the user to check in later, but when the timer is due it automatically calls the emergency services. This action can not be cancelled by the user, so if this was an error it will create a false alarm to the university security team.

Also, this button pops a small window for user to set the timer, this window is small an uncomfortable to use, it does not consider users with disabilities and is not suitable for an emergency as requires concentration from the user to pick the desired time for the timer.

This does not align with the following principles:

3: User Control and Freedom

Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.

Solution: A button to cancel this action should be included

2: Match Between the System and the Real World

The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon. Follow real-world conventions, making information appear in a natural and logical order.

4: Consistency and Standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform and industry conventions.

Solution: the naming of the button should be rebranded, example:

- **Auto-Alert**
- **Automatic Emergency Call**
- **Security Auto-Trigger**

Alert Devices Page

It provides an interface to pair with “alert devices” nevertheless does not show a list of the compatible devices or instructions on how to do it as consequence the user will need to read the documentation to pair a device with the application.

This does not align with the following principles:

10: Help and Documentation

It’s best if the system doesn’t need any additional explanation. However, it may be necessary to provide documentation to help users understand how to complete their tasks.

Solution: Add clear and concise set of instructions along with icons of compatible devices. Example: smart watch, security necklace, etc.

Evaluator: Mingze Gao

Product: UofG safe zone

Problems:

(1) The Check-in Timer button on the homepage lacks clarity. When a countdown is set, it automatically triggers an alarm without a clear indication of its purpose.

> **1.Visibility of System Status** - The system should provide clear feedback on what the timer does before activation.
>
> **2. Match Between System and the Real World** - The function should align with user expectations and be explained in familiar terms.

(2) After tapping the Check-in button on the homepage, users often forget to tap Check-out when leaving, only realizing later that they are outside the check-in range.

> **5. Error Prevention** - The system should provide reminders or automate check-out to prevent user mistakes.

3. User Control and Freedom - Users should have a way to check out automatically or receive notifications before leaving the valid check-in area.

(3) The location menu only allows users to find buildings or places by scrolling; there is no search function to quickly locate a specific place.

6. Recognition Rather Than Recall - Users should not have to manually remember and scroll through a long list to find a location; a search function should be available.

7. Flexibility and Efficiency of Use - Advanced users need shortcuts (such as search) for efficiency instead of only having a slow manual method.

(4) Due to network errors, users often accidentally tap the emergency button, triggering an alarm. The system does not respond in time, nor does it allow users to cancel the alarm, causing inconvenience to staff and students.

5. Error Prevention - The system should implement a confirmation step to prevent accidental emergency alerts.

9. Help Users Recognize, Diagnose, and Recover from Errors - Users should be able to cancel an unintended emergency alert and be given instructions on how to do so.

(5) The flashlight feature on the homepage is unclear and seems unnecessary. Users do not understand its purpose within the app.

8. Aesthetic and Minimalist Design - Unnecessary features should be removed or relocated to avoid clutter and confusion.

2. Match Between System and the Real World - The feature should align with the app's primary purpose; users may not expect a flashlight in this context.

(6) The check-in range is not clearly defined, leaving users uncertain about whether they are within the valid area.

1. Visibility of System Status - Users should receive clear feedback about their check-in boundary before attempting to check in.

4. Consistency and Standards - The system should follow standard location-based rules and expectations for geofencing.

(7) The app language setting can only follow the system language and cannot be adjusted separately. For example, if the phone's system language is set to Chinese, the app will also be in Chinese. To switch the app to English, users must change the entire phone's system language.

7. Flexibility and Efficiency of Use - Users should be able to set their preferred language independently of the system language. 3. User Control and Freedom - Users should have the freedom to customize settings without affecting the entire device.

Evaluator: Yang Song

---

1. This does not fulfil the 1. criterion, which is that the system should provide appropriate feedback to keep the user informed.

Question：

1. Because it is not linked to the student's class schedule, SafeZone cannot pop up at the exact time or notify on the lock screen, so users may not be able to check in and out in time.

Solution:

The solution is to add your class schedule to SafeZone, which will notify the user when the class is about to start or end.

2. The feedback after pressing the main buttons on the home page is not obvious, and it is easy to touch them by mistake.

The reasons for this lack of obviousness are as follows:

1. There is only 1-second vibration feedback after pressing the button.

2. There is a 5-second countdown during which cancellation is possible, but there is no obvious feedback.

Solution:

1. The user can be reminded that a button has been pressed by a 5-second high-power vibration and flashing of the screen.

2. In case of an emergency, the user can set the alarm to mute after a 3-second-long press of the alarm button.

2. Some of the functional buttons in the system are not accurately expressed in language, which may lead to user misunderstanding. This does not satisfy the 2. criterion, the readability of the terms used in the system. For example, many users cannot intuitively understand the purpose and function of the ‘check in Timmer’ button.

For example:

1. Many users cannot intuitively understand the purpose and function of the ‘check in Timmer’ button.

2. It is not fully translated in other language versions, for example, “Enquiry” is not translated in the Chinese version.

3. The design of the settings interface is confusing and not clearly structured. This does not satisfy the 3. criterion of consistency and standardisation.

4. When the button ‘take in timer’ is clicked, the cancel button will overwrite the original ‘check in’ button. This design method is very subtle and not easily noticed by the user, which may prevent the user from cancelling the countdown and lead to a false alarm. This does not satisfy the 6. condition: the user needs an exit to escape from an unwanted state.

5. The flashlight function appears among the three buttons above. This does not satisfy the 9. condition, reducing unnecessary functions.

Individual Heuristic Usability Evaluation Report—Safezone

- **Name:** Wencheng Shi
- **GUID:** 2976762s
- **Date:** 2/2/2025

Product Evaluated

The product evaluated is **SafeZone**, a mobile application used at the University of Glasgow for student check-in, attendance tracking, and emergency assistance. The app features large, color-coded buttons for key functions, including "Check In," "First Aid," "Enquiry," and "Emergency."

Issue 1: Lack of Clear Check-In Feedback

Nielsen's Usability Heuristic Violated:

✅ Visibility of System Status

When a user taps the "Check In" button, the button label changes to "Check Out", but there is no additional confirmation or feedback.

Issue 2: High Risk of Accidental Emergency Activation

Nielsen's Usability Heuristic Violated:

✅ Error Prevention

The Emergency button is large and prominently placed, making it prone to accidental activation. If a user mistakenly taps the button, they must cancel the

alert within a short window, or the emergency request will be sent automatically.

Issue 3:Confusing and Non-Cancelable "Check In Timer" Feature

Nielsen's Usability Heuristic Violated:

- ✅ **User Control and Freedom**

The "Check In Timer" function lacks a clear purpose and cannot be canceled once activated. The feature appears to be a countdown timer, but its purpose is not explained anywhere in the interface. Users cannot stop or modify the countdown once it starts, which removes their ability to correct accidental activation.

Issue 4: Compatibility Issues Preventing Check-In on Some Android Devices

Nielsen's Usability Heuristic Violated:

- ✅ **Error Prevention**
- ✅ **Help Users Recognize, Diagnose, and Recover from Errors**

The SafeZone app has compatibility issues on some Android devices, preventing users from checking in. This issue is caused by the app requiring extensive permissions (including location access), which certain Android models may fail to grant properly.

Issue 5: Excessive Permission Requests Causing Privacy Concerns and Battery Drain

Nielsen's Usability Heuristic Violated:

- ✅ **Error Prevention**
- ✅ **User Control and Freedom**

The SafeZone app requests excessive permissions, including constant access to location and Bluetooth, even when the app is running in the background. This creates potential privacy concerns, as users may feel uncomfortable with continuous location tracking. Even if the app is minimized or running in the background, it continues to consume power, reducing device efficiency.

Issue 6: Overly Simplistic UI with Poor Onboarding and Lack of In-App Guidance

Nielsen's Usability Heuristic Violated:

- ✅ **Aesthetic and Minimalist Design**
- ✅ **Help and Documentation**

The SafeZone UI is overly simplistic, lacking in-app explanations or onboarding guidance, forcing users to rely on external help documentation to understand even the most basic functions.

Evaluator: Yaohui Han

Issue Found	Principle	Description
Unable to View Check-in History	6. Recognition Rather than Recall	Users cannot view their check-in history, making it difficult to review past check-ins and track their activity.
High Barrier to Using Security Features	7. Flexibility and Efficiency of Use	The safety features do not work well, and users do not know what to do when they activate them in an emergency. For example, who will be contacted after clicking “Emergency” and what information should be communicated. The app should notify users when they first log in. Or set up a guide in the app so that students know what to do in case of an emergency.
Insufficient Accessibility Features	8. Aesthetic and Minimalist Design	The app lacks accessibility options, such as screen reader support, color contrast adjustments, and text size customization, affecting visually impaired users.