Attend-ease: Phygital Attendance Logging Platform

Title: Attend-ease: Phygital Attendance Logging Platform
SDG #: 9
SDG addressed: Industry, innovation and infrastructure
Type of app: Android Mobile Application

Brief description of the App

Attend-ease is a mobile application software made to stop the traditional way of taking attendance for students and shows the attendance stats to students as well as professors. This application revolutionizes and facilitates the efficient and secure way of taking attendance of students and professors. Professors can generate a unique pin for each session to take attendance in class, and students have to enter the pin from the app after signing-in in the app.

Our team has developed an application that solves all this problem. The primary technique towards the management of different type users is done by creating abstraction between each user. Should any user require to access the data of any other user, our controlled SQL queries will help create tables that pertain to their relevance. By creating different login pages that represent different modules of this project, we have successfully achieved the abstraction that helps solve the problem.

This system helps save time and paper for the professor, as they can just take attendance by generating a pin on click of a button and can access that data through the query, to see attendance of students in his/her subject. For the students, this app allows them to mark their attendance and check the timetable as well as attendance stats.

Interface design

Ben Schneiderman's golden rule	**Brief description of the implementation. Reference to the screens to which it applies.**
Strive for consistency	The UI is very familiar to most apps, there is a 'consistent' quality for both stakeholders: professor and student, where both experience familiar layouts (Appendix 1, screenshot (i)). The app also uses a familiar three-dot menu for user options (Appendix 1, screenshot (ii)).

Enable frequent users to use shortcuts	The ‘back’ button and ‘home’ button provided in android can be used to logout and cancel attendance logging at any time by experienced users (Appendix 1, screenshot (iii)).
Offer informative feedback	Alerts and dialog boxes are present for informative feedback, with toast messages during any significant action made by the user (Appendix 1, screenshot (iv)).
Design dialog to yield closure	Alerts and dialog boxes are present for informative feedback, with toast messages during any significant action made by the user (Appendix 1, screenshot (iii)).
Offer simple error handling	If any invalid attendance code is entered, an error message is shown (Appendix 1, screenshot (v)).
Permit easy reversal of action	As discussed, ‘back’ button can be easily used to navigate back to a page (Appendix 1, screenshot (iii)).
Support internal locus of control	A ‘settings’ page is created for user to control dark mode and notifications’ enabling (Appendix 1, screenshot (vi)).
Reduce short term memory load	The app is one page with three tab views to easily understand and remember where all the functionalities are (Appendix 1, screenshot (i)).

User support

The user support provided by the app encompasses various essential features to enhance the user experience significantly. The ‘Help Page’ (Appendix 1, screenshot (vii)) serves as a comprehensive resource, guiding users through the application's functionalities and troubleshooting common issues. Additionally, the ‘Tutorial’ feature (Appendix 1, screenshot (vii)) provides interactive and step-by-step instructions, ensuring users, regardless of their experience level, can effectively navigate and utilize the app's features.

In terms of requirements, your app excels in several key areas. Firstly, its **availability** ensures continuous access, allowing users concurrent interaction with the main application. The **accuracy and completeness** of the ‘Help page’ resources align perfectly with the actual system behaviour, ensuring users find reliable information.
Moreover, your app maintains **consistency** by ensuring uniformity between different parts of the ‘Help Page’ documentation, creating a seamless user experience. It demonstrates **robustness** through correct error handling, ensuring predictable behaviour even in unexpected situations.

The **flexibility** of your app shines through by allowing users to interact in a manner suitable for their experience and specific tasks, accommodating diverse user needs. Lastly, its **unobtrusiveness** ensures that user support processes do not disrupt the users' workflow, enabling them to continue their work without interruptions. By incorporating these features, your app not only provides effective user support but also establishes a user-friendly and reliable environment, enhancing overall user satisfaction and engagement.

Evaluation Process

The evaluation process was done using heuristic evaluation. The usability criteria that were used was Nielsen's ten heuristics. The heuristics evaluated as follows:

1. Visibility of system status.
2. Match between system and the real world.
3. User control and freedom.
4. Consistency and standards.
5. Error prevention
6. Recognition rather than recall.
7. Flexibility and efficiency of use.
8. Aesthetic and minimalist design.
9. Help users recognize, diagnose and recover from errors.
10. Help and documentation.

The evaluator's scale was as follows:
1 – App is lacking sufficient features to support the heuristic
2 – App is showing basic but unsatisfactory features to support the heuristic
3 – App is showing basic but satisfactory features to support the heuristic
4 – App is showing advanced and satisfactory features to support the heuristic
5 – App is perfect fulfilment of necessary features to support the heuristic.

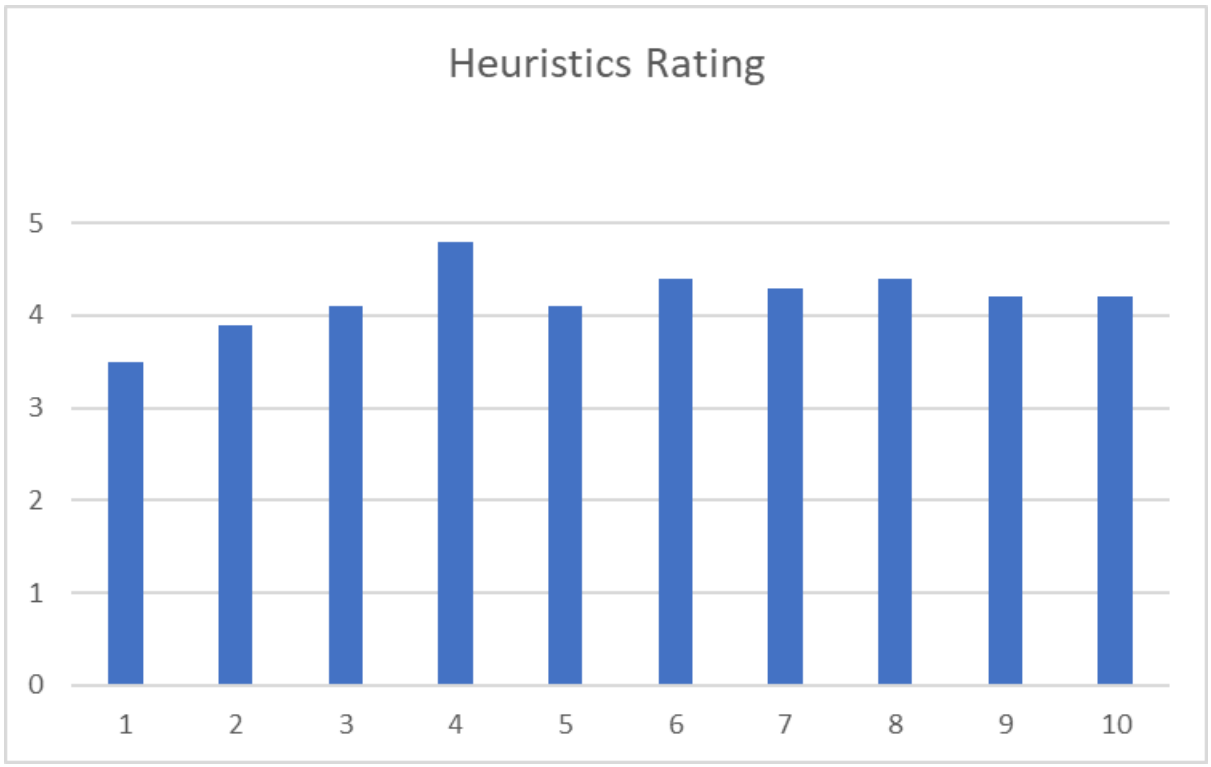
The null and alternate hypothesis was proposed as follows:

Null hypothesis = "There is no significant change in time while taking attendance using Attend-ease compared to the traditional name-calling method"

Alternate hypothesis = "There is a significant change in time while taking attendance using Attend-ease compared to the traditional name-calling method"

After the evaluation, the alternate hypothesis was proved, with most evaluators commenting the smoothness of the process overall for a class of 50 students will take less time. For one-on-one name calling, the app showed no improvement, however as the scale of attendance logging increases, the parallel logging of attendance allowed for time to be distributed, hence showing better time utilization.

A Google forms was circulated to 10 of our peers for evaluation of the app. These are the average scores that were compiled:

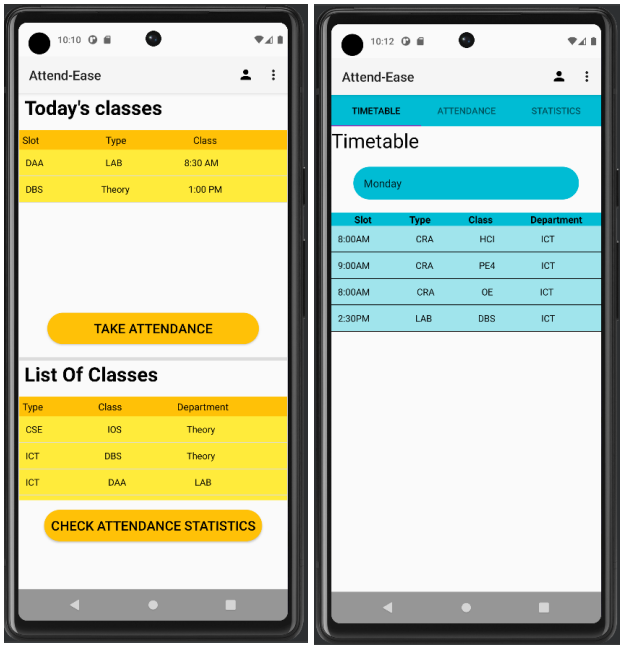


Here, y-axis refers to the rating for each heuristic, and x-axis refers to the heuristic.

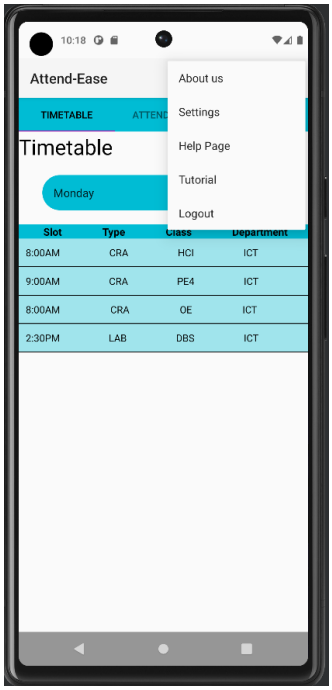
It can be easily seen, that most heuristics scored well between the range of 4-5, while the least score was giving to visibility of system status with an average of 3.5. It is true that system status is not visible, the user is not able to see where there at which point. The app is heavily convoluted in its features and the order in which you can access features, that is a difficult task to add a coherent system status visibility feature, but the improvement will be worked upon.
In contrast to the lowest, the highest heuristic score was for consistency and standards, as clearly, the app followed familiar and consistent UI for most testers.

Check Appendix 2 for results and contact details.

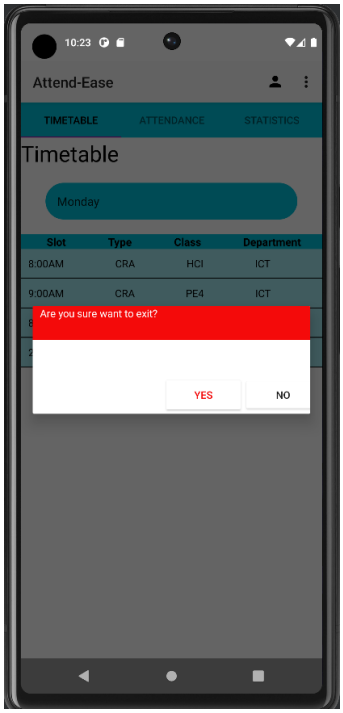
Appendix 1



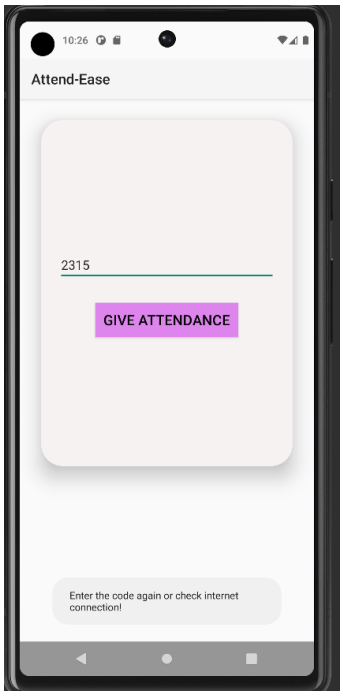
(i) Screenshots of the main pages of both faculty (right) and student (left), with a three-tab layout in one-page for student



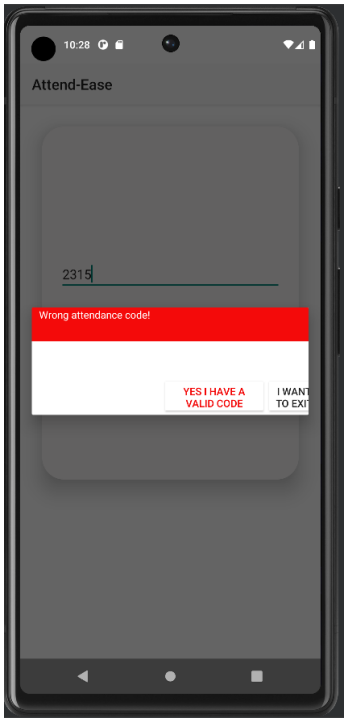
(ii) Familiar use of three-dot menu



(iii) Using back button for logging out, with alert dialog window.

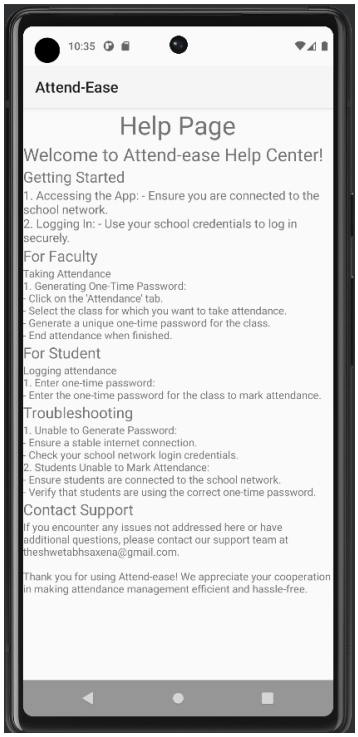


(iv) Toast message for offering informative feedback on actions by the user



(v) Simple error handling

(vi) Settings page with dark mode toggle and disable notifications checkbox



(vii) ‘Help Page’ of the app for user support

Appendix 2

Timestam	Username										
2023/11/	rohanking2003@gmai	4	5	5	5	4	4	5	5	4	5
2023/11/	theshwetabhsaxena@	2	4	4	5	4	5	4	4	5	5
2023/11/	tanvee.dabburi3@gm	2	4	4	5	4	5	4	4	4	4
2023/11/	workwithankit12@gm	5	4	4	4	4	4	4	4	4	4
2023/11/	sanjeta.mani@gmail.c	5	5	5	5	5	5	5	5	5	5
2023/11/	ashwinmagu@gmail.c	5	4	5	5	4	4	5	5	5	3
2023/11/	k.christinarashmi@gm	2	3	3	5	4	4	4	5	3	3
2023/11/	nehakolarkar@gmail.c	4	4	4	5	4	5	4	4	5	5
2023/11/	divyadarshini.1011@g	3	2	4	5	4	4	5	3	4	4
2023/11/	bhargu512@gmail.cor	3	4	3	4	4	4	3	5	3	4

(i) Results of heuristic evaluation

Enter name	Enter phone number	Enter Email id:	Enter bran	Enter type of tester
Rohan	9963409094	rohanking2003@gmail.com	CCE	Developer
Shwetabh Saxena	9380665868	theshwetabhsaxena@gmail.com	CCE	Developer
Sritanvee Dabburi	9014670315	tanvee.dabburi3@gmail.com	CCE B	UI/UX Analyst
Ankit Mishra	7738578175	workwithankit12@gmail.com	CCE	Developer
Sanjeta Manivannan	8870570605	sanjeta.mani@yahoo.com	Biotechno	Beta tester
Ashwin kumar	9965539926	ashwinmagu@gmail.com	Ece	Beta tester
Christina	8080898184	k.christinarashmi@gmail.com	Biotech	Beta tester
Neha	9854677876	nehal113@gmail.com	Eee	Beta tester
Divya	9952040854	Divyadarshini.1011@gmail.com	Bio	Beta tester
Bhargav	9491782977	bhargu512@gmail.com	Cse	Developer

(ii) Contact details for respective responses