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HUMAN COMPUTER INTERACTION

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School of Computing
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A3 – ASSIGNMENT 3

[HEURISTIC EVALUATION GROUP CASE STUDY REPOR]

(Section 01)

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PROJECT TITLE:

SMART PLAYGROUND SYSTEM

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1.0 INTRODUCTION

Nielsen's heuristics evaluation is a method in finding the usability problems during the process of designing a system or an application. It involves a small set of evaluators that examine or test the compliance of an interface design with specified usability principles (Nielsen, 1995). In this report, we applied Nielsen's heuristics evaluations to test the usability problems found on the prototype of Smart Playground System designed by group Stark Inc.

Smart Playground System is an application that encourages parents to teach their children while playing at the playground through various kinds of tasks included. There are three main functions or tasks provided by the application. First, the user (as the parent) can access the "games" function to let his child learn various kinds of knowledge via playing, this can be done by letting the kid complete the task assigned while playing the equipment available. Besides that, the "report" function enables the user to report any faulty equipment seen at the playground to the authorities. Lastly, the "recycle" function enables the user to call the authorities for picking up the waste materials that can be recycled which are found at the playground area.

2.0 METHODS

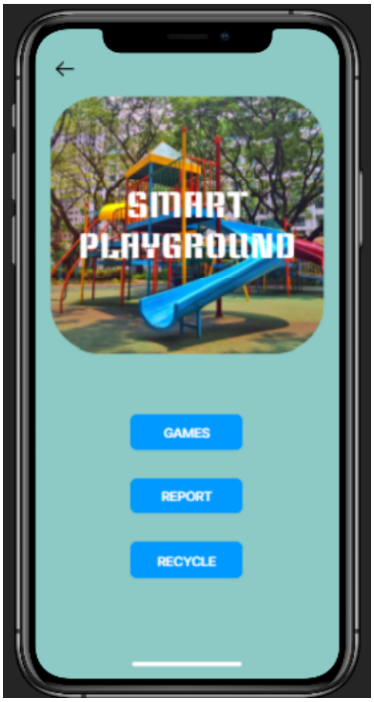
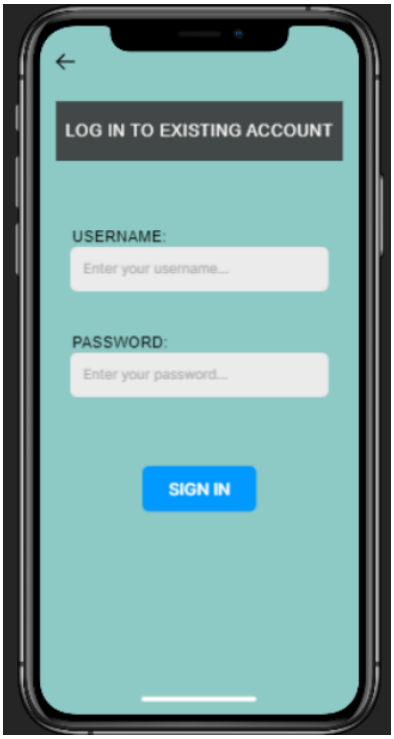
As has been mentioned above, the method of usability Smart Playground System testing is conducted by using Heuristic Evaluation or to be more accurate, we categorize the problem based on Jacob Nielson's Ten Usability Heuristic it has violated. This is the most well-known approach for evaluating early stages of application development among professionals. There are ten basic Heuristics considered as a guideline for us to evaluate other students' applications. Those ten basics include:

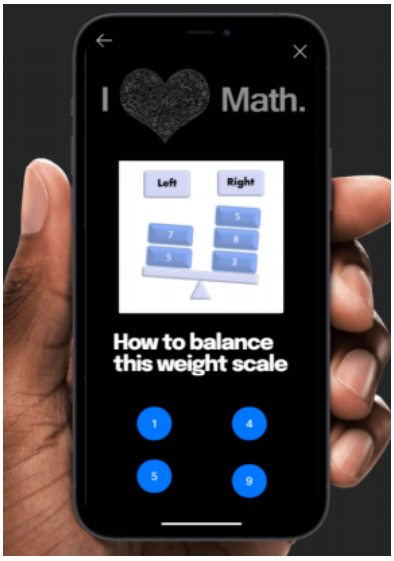
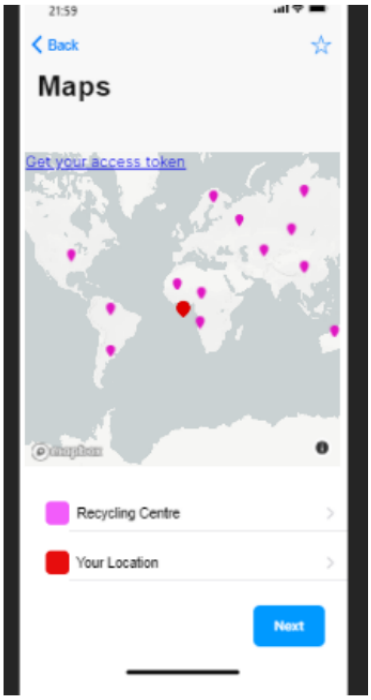
1. Visibility of system status.
2. Match between system and real world.
3. User control and freedom.
4. Consistency and standards.
5. Error prevention.
6. Recognition rather than recall.
7. Flexibility and efficiency of use.
8. Aesthetic and minimalist design.
9. Help users recognise, diagnose, and recover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

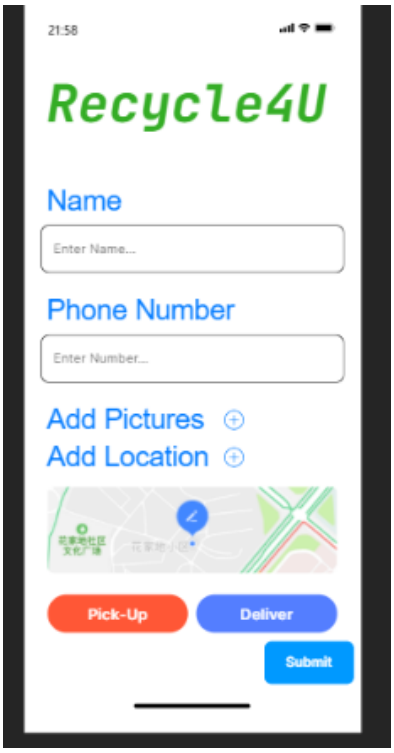
Next, we continue our evaluation by classifying the aspects that we believe can be improved to some levels after utilising those ten basic evaluations to evaluate other students. The level of the features is called Rating Severity. Those levels are:

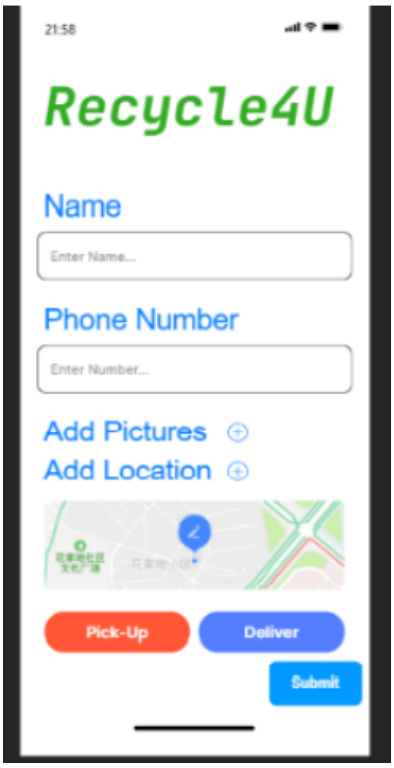
1. Cosmetic issue - Affect the appearance and should be fixed only if time permits.
2. Minor issue - Hinders the user's ability to navigate and should be fixed when possible.
3. Major issue - Frustrates or confuses the user and requires it as soon as possible.
4. Catastrophic issue - Prohibits users from performing their given task and requires an immediate modification.

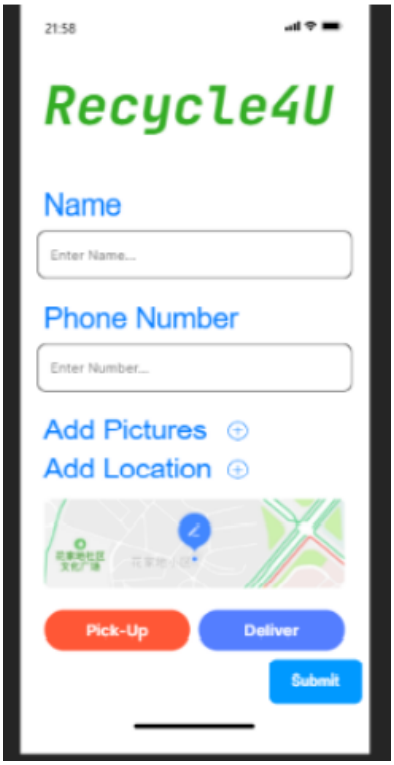
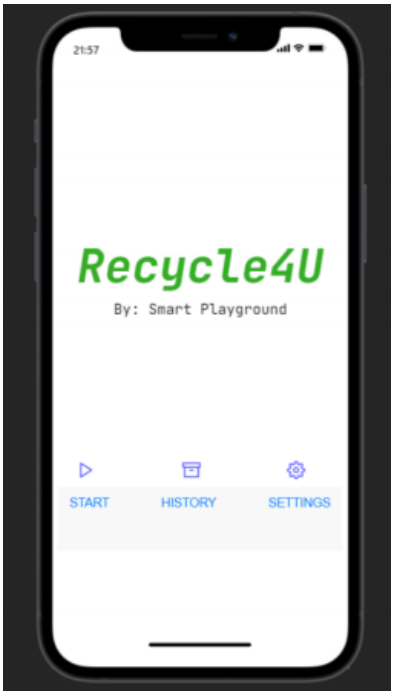
3.0 RESULTS

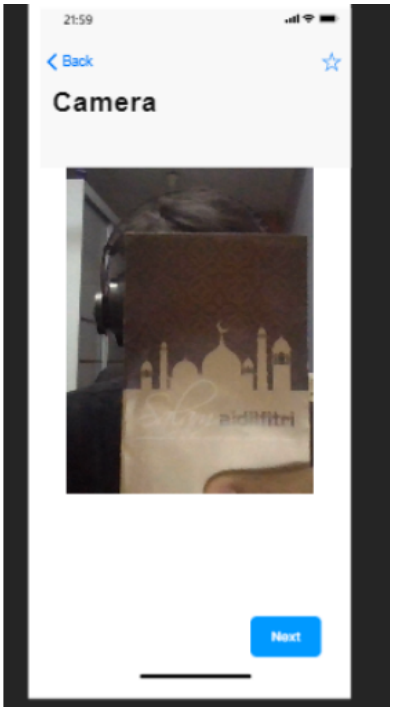
Prototype Image	Identified Issues	Heuristic And Severity
	-Do not have appropriate metaphors to show the meaning of games, report and recycle. There will be a problem if the user does not understand the words. -Low navigation clue. Users will confuse what is the function of the arrow at the top left because the arrow means return but this is the first page of the application.	H6 : Recognition rather than recall. S2 : Minor issue H1 : Visibility of system status. S3 : Major issue
	Do not provide alternate ways to help users if they forget their password.	H9 : Help users recognize, diagnose, recover from errors. S4 : Catastrophic issue

 	Some of the interfaces have different return arrows.	H4 : Consistency and standards. S1 : Cosmetic issue

	There is no feedback after pressing the "submit" button to let the user know whether the report has been submitted or not.	H1:Visibility of System status S3: Major issue
	There is no any button like “Next” button after users enter their location to proceed to the next task. Users will be confused and stuck at this interface, if they choose to enter a location. Thus, an instruction may be needed to guide the users.	H10: Help and documentation S3: Major issue

	The system only shows the history, but does not show the date and time for the delivery/pick-up of the waste materials.	H1:Visibility of System status S3: Major issue
	No phone verification. Scammers or irresponsible people might use this application to scam the workers.	H5: Error prevention S2: Minor issue

	No description slot for the waste materials. This is very important, especially the size and the weight of the waste materials. If the waste materials are too big it might be hard for the worker to deliver the waste materials.	H10: Help and documentation S2: Minor issue
	-No help button for assistance. As the user might put the wrong phone number or address and need assistance. -No return and exit buttons and this will make it difficult for users to go back and to the main page. -There is no information slot on this page. As users want to know when the waste materials will be delivered and how the waste materials will be processed. As the	H9: Help users recognize, diagnose, and recover from errors S3: Major issue H7: Flexibility and efficiency of use S3: Major issue H10: Help and documentation S2: Minor issue

	worker might just remove the waste materials to other places.	
	Do not have the button to take a picture. It is unclear that the picture should be from gallery or snap or both can.	H1:Visibility of System status S4 : Catastrophic issue

4.0 DISCUSSION

During our implementation of the Heuristics Evaluation where the user experience (UX) and the user interaction (UI), we use Nielsen's Heuristics as our main source of guideline for which is very famous for evaluating individual products. Our group is required to do evaluation based on the 10 guidelines to help us to carefully inspect the usability of other groups' products as well as our own product in search of faulty design or performance of the product.

During the completion of the Heuristics Evaluation in reference to the Smart Playground System from group 3, we were able to find some usability defects that would require the team's attention that somehow violates Nielsen's usability heuristics. We ought to think that the main page of the system is fulfilling at least two Nielsen's usability heuristics : visibility and recognition rather than recall. The system has its advantages and disadvantages. For instance, in terms of recognition, the main page offers a range of view as there are only a few buttons present to help users navigate throughout the process of selecting the three main tabs; Games, Report and Process. Although the functionality of the are satisfying, the lack of adequate icons or appropriate metaphors are considered troublesome, especially for elderly users that may not be able to process the situation properly. This is the case users may misinterpret words due to young (children) age or unable to read due to old age (parents). Improvement in references to visibility is the background colour should have some contrast in colour. The colour layout of buttons and background are indeed not similar but the degree of difference is insufficient. The system should use a variety of colours to better differentiate the buttons and background. The words used in the system are quite visible but should consider using bigger fonts. This is because for example, we couldn't see our phone screen well when outside because of the sun. We faced difficulties in recognizing the buttons well under the sun at the park. Using bright and dark colours should be able to solve this problem. We noticed that there is an arrow on the top left corner of the screen which basically means 'return' to the previous page. However, considering that we are still on the same page, the main page, this raises questions about the whereabouts of which where the system leads the user if the user presses it. We assume that it is the exit button. Nevertheless, this major issue is very serious and must be addressed to the developer. Adding an additional 'exit' button is compulsory for this matter.

Next, we move to the login page where the users are required to login into the system in order to get access through the system. The Nielsen's heuristics which is to help users to recognize, diagnose, and recover from errors states that error messages should be sent to users if they are such attempts that violate the system's protocole. It is well known that cases of users forgetting their password are practically common and such events should be taken into account when developing a system. The absence of the 'forgot password' button is a disaster and is unacceptable. The developer must reconstruct the system to comply with the problem as soon as possible. Apart from that, there are no error messages when users attempt a wrong username or password when logging in. Hence, users would have trouble recognizing the problem. Although the process of logging in into a user's account is easy and is customary nowadays, lack of error prevention as well as error recovery are not negligible.

Going through the location page where users are instructed to put in their current address into the system, we have found that the 10 Nielsen's guideline has been disregarded. We observed an unidentified step was missing along the process. User needs to share their location with the system but the user failed to recognize whether or not the system has already been successfully kept in the database. The users may find it puzzling to proceed to the next task and will remain stuck at this interface even if they manage to comply with the task. Help and documentation, according to Nielsen;s heuristics is a must to navigate users throughout the entire process, at least during their first time using this system, in order for them to familiarize with the system. A simple 'Next' button or a message for the user to acknowledge the successfulness of the process is highly appreciated.

Moving on to the next few pages, the question and map interfaces. Nielsen's heuristics suggest consistency and standards but these interfaces seem to violate it. What Nielsen's usability heuristics consistency and standards means is a product or a system should not confuse the users by the use of different kinds of actions, words, icons or actions to achieve the same meaning. But judging these interfaces, there are clearly different kinds of return arrows. This may seem simple. However, the placement and the shape of the return arrows might cause the users confused and feel unfamiliar with the inconsistency. Smartphone users tend to hold their phone with specific grips but as the button placement changes, either high and low or right and

left, it can be very frustrating to frequently adjust the finger movements which for some, may cause numbness.

In addition, the main page of the function recycle has also some features that did not obey Nielsen's heuristics such as help users to recognize error, flexibility and efficiency of use and help and documentation. There will be sometimes when the users accidentally enter a wrong number or address. Thus, it is necessary to let users have the ability to recover from errors. Another thing is that it will be a trouble for users to go back to the previous or home page because this page did not have any navigation key. Users will confuse when they want to view the previous page but this page did not have any shortcut to do that. There is also a problem because this page did not provide any information about the waste products like when the waste material will be delivered and also how it will be processed because the function of recycling is to carry away waste materials and exert appropriate methods to propose it. Thus, extra information about waste materials is needed.

Next, we found that the ‘Recycle4U’ page seems not to fulfill the visibility of system status, error prevention and help and documentation as Nielsen's heuristics would suggest. Visibility of system status refers to how important it is for a system to let users know what is going on, with the implementation of appropriate feedback. The problem with this page is that there is no such appropriate feedback after the user presses the ‘submit’ button to properly address the user that the report has been submitted successfully. The reason appropriate feedback is really important is that some people will not be comfortable enough to use the application because they think that their requests or actions are not processed properly thus encouraging them to think that the application has some bugs. Not only that, the lack of appropriate feedback may cause the user to spam the submit button many times which not only causes problems on their sides, but also a time wasting for the receiver of the report to go through the same report too many times. If there is feedback telling users that the report has been successfully submitted, they will be convinced to make use of the report again in the future. Next, users can easily submit a waste recycle report without any verification of the phone number. This has violated the error prevention principle in Nielsen's heuristics as users can submit a wrong number just for fun. Furthermore, it will be difficult for deliver to carry away waste materials since this page did not show any requirement about information of waste materials.

The ‘history’ page also violates one of the heuristics which is visibility of system status. There is a lack of important information that we want to obtain from a history section which is the date and time for the delivery or pick-up of the waste materials. This information-lacking history page will not be useful to track if there is any problem that happens during the process.

Lastly, we also discovered that there is a serious problem on the add pictures interfaces for the recycle function. This is because it did not have any guide or button to tell the user how to add a picture. For example, users will be confused about whether they should upload a picture from a gallery or snap a picture and also how to do these actions as there is no button to do that. This will definitely prevent users from completing their tasks.

Summary

Smartphone Apps	Problem	Severity Rating	Heuristic Category
Smart Playground	Low navigation clue	3	H1: Visibility of system status
	No feedback	3	
	Less of data	3	
	No button	4	
	Different icon of same function	1	H4: Consistency & Standard
	No phone verification	2	H5: Error Prevention
	No icon for games, report and recycle	2	H6: Recognition not Recall
	No return and exit button	3	H7: Flexibility & Efficiency of Use
	No way to help if forgot password	4	H9: Help Users with Errors
	No help button	3	
	Lack of ‘next’ button	3	H10: Help and Documentation
	Description slot for waste materials does not exist	2	
	Lack of waste materials information	2	

5.0 CONCLUSION

In conclusion, we found out that the Smart Playground System needs to be improved on the factor of visibility of system status where 3 major issues and 1 catastrophic issue have been found. This is indeed a serious problem and must be solved immediately as it will confuse the user while using the application. Besides that, we also found out another major problem on the factor of helping users recognize, diagnose, and recover from errors that requires immediate fix from the designer as there are one catastrophic issue and one major issue seen by us. Other than that, there are also little major issues and a significant number of minor issues found by us throughout the evaluation using Nielsen's heuristics.

Throughout the evaluation of the Smart Playground System designed by group Stark Inc, we learned the way of evaluating problems or issues from the prototype of the system via Nielsen's heuristics. We also gained deeper insight in the way of designing a user-friendly system and identified the major issues that must be avoided while creating a system or application. Hence, we will be able to design a better system in future with the lesson learnt through this evaluation.

6.0 REFERENCES

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