

Human Computer interaction

Assignment 2 Report



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Introduction & Background

The overall objective of the evaluation problem is to come up with recommendations on how to improve/enhance people’s experiences when interacting with an application or technology. This problem carries out an evaluation of an existing multi-player smartphone game. The purpose of this is to improve the way people interact with their smartphone when playing the game and/or interacting with the game content, in a stable or varying use context. In order to evaluate product, there are two options, both containing different techniques to carry them out. The first one is, evaluating with users. The approach for having users for evaluating a product splits into two: in controlled environments and in the wild. Controlled environments are set up by experts to observe users’ interaction with the product. First one of the controlled setting techniques is called usability testing. Its purpose is to focus on how well users perform tasks with the product. The testing based on typical tasks and it is common to record users’ performance by video or audio. Some of the testers might time the completion of tasks as well as observing how they are carried out by the users. Additional to the time data, number of errors classified by type of errors are recorded as well. Comparison of similar products or prototype is common for this kind of evaluation. This technique can be carried out in a lab, in an environment where the lab equipment can be set or in a portable lab. The data is collected throughout typical tasks that a user would carry out normally when interacting with the product. Interviews and questionnaires can add to this data and help to explain errors or frustrations. One of the key points of this technique is choosing the right representative users and representative tasks. In order to carry out this technique, the test users would require to be informed by a consent form that explains the procedures and deals with ethical issues. It is most important for this technique to work that each user has the same testing conditions. One of the advantages of this technique is that it is uninterrupted. It gives to opportunity for testers to assess performance, identify errors and help explain why users did what they did throughout the testing. Moreover, testers can use this technique in conjunction with satisfaction questionnaires and interviews to elicit user opinions. On the other hand, controlled settings are artificial, therefore, they lack context. The data collected would be misleading if the chosen users and typical tasks are not suitable to test the product in depth. It requires an investment of time to set up the tests, recruit participants, run tests and, if used, write up questionnaires and conduct interviews. Another technique that is used in controlled environments is conducting experiments. Experiments rely on formulating and testing a hypothesis related to the product. As any other experiment, this technique would require testers to predict the relationship between two or more variables. Experimenting requires independent variables that are manipulated by the researcher and dependent variable is influenced by the independent variable. Common typical experimental designs have one or two independent variables. Experiments should be validated statistically and replicable. When it comes to participants, there are several choices for experimenting. First one is having different participants. A single group of participants is allocated randomly to the experimental conditions. If this technique is chosen, then no order effects the experiment, but many participants are required, and individual differences are a problem. Second one is having same participants. All participants take part in both conditions. If this technique is chosen, then few individuals are required as individuals does not cause differences, but counter balancing is required because of ordering effects. The final one is matched participants. The participants are matched in pairs based on expertise, gender or etc. If this technique is chosen, then no order effects the experiment but individual differences are reduced. However, cannot be sure of perfect matching on all differences. Experiments test hypothesis to discover new knowledge by investigating the relationship between two or more things. Usability testing is applied experimentation. As for the second approach, in the wild, there is one technique, which is field studies. Field studies take place anywhere other than a controlled lab, in natural settings, the real world. Through field studies, observations, interviews and logs are collected in natural settings. The aim is to understand what users naturally do and how technology is used in the context of their day to day lives. Observations and interviews produce a range of data, including notes, photos, video, audio and/or logs. Self report is also commonly used to gather information about user experiences such as diary studies and questionnaires. During the field studies, observation should be done either from a distance or closely working. Observations should be noted down on a specially designed form. If the tester has the resources and the participants agree on it, video or audio recording may be appropriate as well. Observations should be made on problems seen while users interact with the product, the tasks that the users carry out, the way the product mediate social interactions, whether the product is used as expected, whether users enjoy their interaction with the product, whether there are any disruptions to the tasks, etc. Interviews are as important as observations and should take place during the testing activities or after the testing activities. The interviewer may take notes or make audio recordings during these interviews. The interview should aim to find out whether users have enjoyed or satisfied of their overall experiences, follow up on interesting observations throughout the testing, find clarifications where an event or activity was unclear, ask for examples to back up general points, give the participant a chance to say anything else they want. Data gathered through field experience can be analyzed through simple counts for summarizing. Meaning, features mentioned positively by most users, problems highlighted by most users, etc. Categorizing comments and events under themes or type of interaction is another option for analyzing data. Data presentation aims to show how the product is being appropriated and integrated into their surroundings. The aim is rather to capture and reflect usage than to prove something contrary to experimenting. The advantage of this technique is that it helps to understand what users naturally do and how technology impacts them in context. Moreover, evaluating in real usage is the only way of finding out whether a design has been successful in its aims. On the other hand, it has disadvantages of access to settings which provides context for the testing of the app. A natural environment would be a social one, and that is why there would be a lack of control, joined by noise and distractions. Additionally, in such a context it would be hard to capture detail of usability issues. The second type of evaluation is evaluation without users. Heuristic evaluation is a commonly used technique developed by Jakob Nielsen to conduct evaluation without the need of any users. Original heuristics have been revised for current technologies and now are closely related to design guidelines. Heuristic evaluation can be done without users because it involves experts examining a design to see if guidelines are violated or not. One of the advantages of using heuristic evaluation is the lack of need of ethical and practical issues to consider because any users are not involved in the evaluation. Another advantage is having experts doing the evaluation because best experts have knowledge of application domain and users. Therefore, their evaluation is more complex and accurate than user evaluations. Heuristic evaluation can also be quicker and less resource intensive than user studies as finding many participants and setting for evaluation is no longer an issue. However, when it comes to finding experts, it may be difficult to find a specific person as experts are not as common as typical users. Moreover, finding experts can be expensive as their expertise is the way they earn money. When an expert is conducting the evaluation, there is also a slight chance of missing important problems if the expert is not thinking “out of the box”. Someone who is used to see same mistakes will eventually look for those mistakes, which causes this issue, where a typical user would encounter more basic yet rare problems as well. Related to the same problem, most of the experts often identify many trivial problems and rarely stumble upon anything useful. To conclude all, there are a wide range of approaches to choose from, including those involving users and those which do not require user involvement and every approach has its compromises and challenges. Therefore, it is common to choose two or more methods which complement each other.

Evaluation Approach

To fulfil the objective of the evaluation problem, an existing multiplayer game for smartphones is required. The game chosen for the evaluation is UNO! ™ made by Mattel163 Limited. This game is suitable for this evaluation for couple of reasons. First of all, when the game launched for the first time with a new account, a tutorial is given to all players. The tutorial teaches the classic rules and how to interact with the graphical user interface in order to play the game. Followed by the completion of the tutorial, the game forces users to attend a quick match in one for all mode to introduce how to join matchmaking games. This is useful for players to experience the game and interactions with foreknowledge, which means users can have a more personalized participation. However, this has the potential to result in an undesired effect as users are not allowed to explore the interactions they can have within the game, so it is impossible to observe whether the interaction options are visible to users if there was not a forced tutorial. Another reason for why this application is suitable for this problem is because besides the matchmaking games, users can get to the social section of the application to find and add each other, then to create a private room and invite others to play together. As mentioned in the conclusion of introduction and background, it is common to use more than one technique of evaluation for a problem. The evaluation approach that will be used consists of usability testing, field testing and Nielsen’s heuristic evaluation. Therefore, there will be two sections to the evaluation. First part will be done including participants to follow tasks and observe users as they play the game, and the second part will be done by inspecting the app to depth without participants. The combination of these techniques requires many resources as participants, settings, questionnaires, etc. However, the techniques used potentially can even the disadvantages they naturally inhibit. The usability testing is chosen to be done with two test groups. One of the groups will be consisted of older individuals who are not familiar with neither mobile games or technology, between the ages of forty five to fifty five. The second group will be consisted of a younger group of individuals who are familiar with both mobile games and technology, between the ages of eighteen to thirty. Several tasks will be given to the participants and their performances will be observed. This includes errors that occur during the completion of a task, number of helps that is required to complete a task, number of users completing a task successfully. For this task, a minimum of five people will be used. As each participant’s performance will be observed and tasks will be given concurrently, the number of participants for a session has to be limited to a small number in order to observe details. First task in the list is to login using or creating an account. The account used should not be connected to the game in order for every user to go through tutorials. The following task takes place after the forced tutorials are completed and it is to view tutorials that are located within the application, reachable from the main menu. Third task is to turn off application’s notifications from the settings. The next task is to view personal character’s information that is reachable from the portrait on the main menu. Fifth task is for each participant to find their user identification numbers, which is actually the next step of viewing personal character information as the numbers is displayed in the same page. The following task is for participants to add each other through the social section of the application, which the process requires the use of found ID numbers. The next task is to view player’s achievements, which is crucial for the application as prizes are given frequently, meaning that this section is used frequently as well. Eighth task is to collect the rewards from the achievements. The following task asks for personalization of any kind from participants, primarily recommending a change in portrait. The final tasks are separated for a host and other players, preparing participants for the next stage of evaluation. Host has two tasks, which is to view “bag” section and apply room key item to create a custom game room and the next is to invite friends. Players’ task is to wait for the invite and accept. The next part is the field study as two groups used in the last part will be in different settings as the groups are of different individuals with different personalities. For the young gamer group, one of the many places to play a party game is a pub, and for the older non-gamer group, one of the many places is a living room in their home. The participants will play the game they have set and will be required to fill out a questionnaire. The focus of the questionnaire is to find out whether the users have enjoyed their experience, had any difficulties, found any interaction helpful, how comfortable they were while interacting with the app and how the application was compared to any other similar application. Finally, heuristic evaluation will be made to compare the findings from other techniques and find what has been missed from the conclusions of those techniques. To conclude, three of the techniques, with and without users, will be used to gather data and then compared to get a more accurate analysis out of them.

Findings and Discussions

Findings based on participant involved techniques led to data that application is generally found easy to use and simple. Compared to its similar kind, the application was found to have a more functional interface and to have easier navigation, yet similar. Tutorials were found helpful by non-gamers and satisfying by gamers. Both groups were satisfied by the application and enjoyed their interactions. It has been noted that a user complained about too many pop-up screens on the main menu. A non-gamer mentioned the game time to be too short and it made the participant uncomfortable. While participants of the young gamer group said they enjoyed the game and may continue to play after testing, older and non-gamer group mentioned they are not fond of such game applications. Observations on tasks revealed that notification settings are not located at the same location for Android and IOS versions of the app, which caused confusion for participants. Viewing tutorials, personal information and personalizing game was found simple. The user ID was mentioned to be too small and not clear as it was also grey colored. While adding friend, participants were not sure on where to click. Additionally, participants had difficulties finding “gameplay” section when they were asked to collect rewards. Using the participant data and the data of heuristic evaluation (that is in the appendix), most of the issues analyzed to be in the process of adding friends and about user IDs. When it comes to user IDs, many alternative versions have been used in other applications. A very effective solution for this is to use username and only couple of additional numbers. Usernames are set only for display within the app where they can be also used to solve this problem by changing algorithms. Adding friend has a priority for GPS option, where if the design changes to prioritize searching for user IDs, then participants would be able to use this service easier and with lesser confusion during the process. Alternatively, the GPS and search friends could be in separate sub headings to feature both functions equally, if the developer desires that.

Conclusions

The conclusion of this report on evaluation of UNO! ™ application, analysis of data gathered by both participants and expert evaluation shows that the application is generally satisfying and enjoyable, more to young gamers than old non-gamers, even in distracting environments. The application has minor problem that can lead to simple implications for design improvement, however does not affect the functionality, even though it might prolong some processes such as adding friends.

References

Human Computer Interaction lecture slide 7 and 8:

<https://canvas.sussex.ac.uk/courses/10038/files/folder/Slides/Lecture%20Slides?preview=980603>

<https://canvas.sussex.ac.uk/courses/10038/files/folder/Slides/Lecture%20Slides?preview=993368>

Appendices

Usability Tasks

Task 1: Login

Task 2: View tutorials

Task 3: Turn off notifications

Task 4: View your character info

Task 5: Find your ID

Task 6: Add a friend

Task 7: View achievements

Task 8: Collect rewards

Task 9: Personalize your game

For Host:

Task 11: View "bag" section and apply room key

Task 12: Invite friends

For Players:

Task 11: Join invitation

Proceed with the game and usability questionnaire...

Field Testing Questionnaire

1. How was your experience when finding your way around the app?

2. How was your experience when you had to add friends and create/join game?

3. How was it compared to other similar apps you have used?

4. How easy was it to figure out the correct sequence of actions to take you to the next task?

5. How was it compared to other similar apps you have used?

6. What was the most difficult and easiest tasks?

7. How do you think the visuals (animations, etc.) affect the game?

8. Have you played UNO before?

9. Did you require any tutorial contents to learn how to play the game?

10. How comfortable did you feel while playing the game?

11. How helpful were the information provided in the game?

12. How did you enjoy your interaction with the app?

How were you satisfied with your interaction with the app?

13. Were there any events or activities that were unclear to you in the app?

14. Is there anything you would rather have differently?

Anything you would like to add that the questions did not cover?

**Human-Computer Interaction Module Project**

**RESEARCH ETHICS: PARTICPANT CONSENT FORM AND INFORMATION SHEET**

**Project title:**

Evaluation of a smartphone game

**Project information:**

The overall objective of the evaluation is to come up with recommendations on how to improve/enhance people’s experiences when playing the game. Participation is required to collect data which are the experiences. Each participant requires to carry out tasks that only involve interaction with the application, play the game and answer a questionnaire to reflect their experiences. The activity will take a round of the game and extra navigation through the application. Therefore, no longer than 30 minutes. The data collected will be used to compare with expert’s evaluation and drawing up guidelines for design improvements. Any data collected will be stored anonymously and securely, not shared with anyone other than the researcher or the supervisor, and participants will not be identifiable in project outputs such as the presentation

|  |  |
| --- | --- |
|  | Please circle as appropriate |
| 1. I confirm that I have read and understand the project information and have had the opportunity to ask questions. | Yes/No |
| 1. I understand that my participation is voluntary and that I   am free to withdraw at any time, without giving reason. | Yes/No |
| 3. I agree to take part in the above study. | Yes/No |

Name of Participant Date Signature

**Contact details:**

Researcher: Ege Bulut (eb431@sussex.ac.uk) (Highlighted as black if candidate name is a problem.)

Supervisor: Dmitrijs Dmitrenko (d.dmitrenko@sussex.ac.uk)

|  |  |  |
| --- | --- | --- |
| **Heuristic** | **Your assessment:**  What is the problem? Where is it? Why is it a problem? | **Severity of the problem:**  (Minor, Fix Later, Fix Now) and recommendation (how should it be fixed?) |
| **Visibility of system status**  (e.g. are users kept informed about what is going on?) | **What:** There are too much information.  **Where:** Main menu.  **Why:**  Processing all this information makes the app seem more complex and difficult to grasp than it is. | This is a minor problem and the fix is to put some information under another button. There is already a button called store that opens up options of purchase and there are many interactable buttons in the main menu that can go under there. |
| **Match between system and real world**  (e.g. is the language used at the interface appropriate for the user?) | **What:** Icons are not descriptive enough.  **Where:**  Main menu.  **Why:** This problem causes users to take longer time to identify the options/buttons. | This is a minor problem and the fix is to change the icons. For example, “events” and “daily” have similar icons and they are at the same color which doesn’t show detail. The change of icons can be both in shape or color, to be made as “initiation” icon. |
| **User control and freedom** (e.g. can users easily leave an unwanted state?) | No problem – User isn’t flexible to get into any unwanted states. |  |
| **Consistency and standards**  (e.g. are the ways of performing similar actions consistent?) | **What:** Exit buttons.  **Where:** Pop-up settings from main menu.  **Why:** Some pop-up screens have a different design compared to others, including different exit button locations, causing a slight discomfort for users. | This is a minor problem and the fix is to use the same design as the mostly used one in the entire app. |
| **Error prevention**  (e.g. are errors prevented where possible?) | **What:** Dialogue box doesn’t have a character space number indicated to the user.  **Where:** “Search” sub heading in “Social” menu  **Why:** This information is required for users because excess use of characters can cause technical issues. | This is a minor problem and the fix is to identify the data type and amount this input can take and add it as a limit to the dialogue box for users to see when they want to enter an input. |
| **Recognition rather than recall**  (e.g. are objects actions and options always visible?) | **What:** User ID.  **Where:** “Search” sub heading in “Social” menu  **Why:** Users are required to remember an ID with a length of 12 in order to add another player. | This is a minor problem and the fix is to use a different algorithm to create the user ID’s. For example, rather than using a 12-character number, an ID constructed from the username followed by a hashtag and 4 numbers as the Blizzard have done is more convenient for users. |
| **Flexibility and efficiency of use**  (e.g. can expert users tailor frequent actions?) | **What:** Limited search for friends.  **Where:** “Search” sub heading in “Social” menu  **Why:** Users can add each other only through IDs which is inconvenient for users. | This is a minor problem, can be fixed later and the fix is to improve the algorithm by defining users with not only IDs but with usernames. |
| **Aesthetics and minimalist design**  (e.g. is all information provided relevant?) | **What:** The played cards in the middle and partner’s cards in 2v2 mode, are too small and the background is too colorful.  **Where:** Game session  **Why:** The visibility of the game is lowered. | This is a minor problem that can be fixed later, as it does not affect the game functionality. It can be fixed by larger card visuals and changing the background to a solid color, such as a table top image. |
| **Help users recognize, diagnose, and recover from errors**  (e.g. are error messages expressed in plain language and do they suggest a solution?) | **What:**  Error messages are displayed mostly on other text and stay for a short amount of time.  **Where:**  On top of screen.  **Why:** Not very useful if users can’t read the messages. | This a minor problem with a quick fix, messages can have a darker background and stay for longer, additionally the color could be a negative contrast to the main themes for extra attention. |
| **Help and documentation**  (e.g. can assistance be readily found?) | **What:** Besides the help page, there is no fast access to a guide to navigation for menu screen.  **Where:** In the app.  **Why:** Help section has all the questions in it with a search function and is not directly reachable from the main menu, therefore a user who needs in help in the menu may encounter difficulties. | This is a minor fix and the fix is to include a tutorial or help section directly in the menu, only about the menu additional to the whole help section that is in the settings section. |