

**MSc in Computing - Team Project**

**User Evaluation Report**

**Group 2- DPTFM**

**Horizon Game Engine & Dark Pattern’s game**

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Introduction

User Evaluation is an important process of building a project. It allows the developers of the project to receive invaluable feedback regarding whether the desired users, targeted through our user personas, are likely to use the program created. In the case of group2, we are one, building a game engine designed to provide an open-source API framework in which users can build their own game engine on top of, two, provide a UI application that users can make their own games on and three, creating a dark pattern’s game to teach users about dark patterns through a video game medium.

In the following sectors we aim to break down the process of how our user evaluation took place. First, in the proposed hypothesis section we discuss the evaluation methods chosen and how they will help to define a hypothesis or success measurement of our project. Next, we discuss the execution of the experimental method and finally, we discuss the conclusions we derived from the execution of our experimental method.

# **1. Proposed Hypothesis (What Questions Are You Asking?) (300 words)**

Explain the questions you are asking in your experiment and why they are important. Also provide an overview of some interesting, important, and relevant existing work in relation to evaluating such hypothesis (e.g., how is this hypothesis typically evaluated, do previous evaluations, if any, have any flaws?). For existing work provide appropriate citations and screenshots.

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In order to assess how we are going to evaluate our game engine and dark patterns’ game project we needed to decide on a collection of suitable evaluation methodologies.

In researching this process, we discovered that in Chover et al. (2020), used a process where participants were asked to complete the task of making a 2D game in 20 hours using a ‘reduced set of actions and conditions’ simplified game engine. A Likert scale questionnaire was then given to the participant with questions analysing their tasks for perceived usefulness of the application and perceived ease-of-use. Additionally, I think we can mention the work of Maier & Harr (2020), who investigate dark patterns from an end user point of view using qualitative means of data collection. With this collection of works mentioned, there is evidence that shows qualitative investigation into similar hypotheses of works. We aim to contribute and further these associated fields of work through experimentation of our project.

To this end we chose to conduct the user evaluation methodologies, cognitive walkthroughs and an open-ended set of qualitative questions analysing the tasks asked of the users selected.

## Cognitive walkthrough – task sets

In order to test the different aspects of our project two different sets of user tasks were created, one to cater to downloading and creating a game with the Horizon game engine UI application and the other to downloading and playing the dark patterns game we have created. We can see both task sets below.

Task set 1: Game engine UI application

1. Were you able to register and login on to the website?
2. Were you able to locate the community page and ask a question?
3. Were you able to find the documentation and tutorial pages?
4. Were you able to find out how to download the game engine?
5. Were you able to set up a project on the game engine?
6. Can you create game objects easily using the button ‘Add a game object’?
7. Can you add components without difficulty?
   1. Can you add a sprite component?
   2. Can you add an audio component?
8. Can you detect the coordinate inputs for adding/changing X and Y positions of game object?
9. Can you detect the console for scripting and create a script?
10. Can you find the output and logging viewport?
11. Can you find how to run your game?

Task set 2: Dark Pattern’s game

1. Were you able to register and login on to the website?
2. Were you able to find out how to download the dark patterns’ game?
3. Were you able to set up the game?
4. Were you able to pick up the controls of the game easily?
5. Are the objectives of the game clear to you?
6. Were you able to answer the quiz at the end of the level?
7. Were you able to exit the game?

Qualitative questions

Once the user tasks have been completed the users will be presented with a corresponding set of open-ended qualitative questions to get the users overall impression of the project:

Question set 1 – game engine:

1. Do you have experience coding?
2. Do you have experience with game development?
3. Did you like the design of the website?
4. Did you find any challenges navigating the website and setting up the game engine?
5. Is there anything you would change?
6. Did you like the game engine interface?
7. Do you feel the Horizon game engine helped you to better understand game development?
8. Would you use this game engine again?

Question set 2:

1. Did you know what dark patterns were before playing our dark patterns’ game?
2. Did you like the design of the website?
3. Did you find any challenges navigating the website and setting up the game?
4. Is there anything you would change?
5. Did you like the game?
6. Did you like the design and colours of the game?
7. Did you like the sound effects used for the game?
8. Did you understand the concepts of dark patterns taught via game?
9. Do you feel the Horizon game engine helped you to better understand game development?
10. Would you play this game again?

## Hypotheses:

Now we have decided how to conduct the user evaluation, we have devised some hypotheses to the mark of success on this project:

**Success of Game Engine.**

H1: The game engine user was able to increase their understanding of game development through the Game engine.

H2: The game engine user should easily use the features and functions provided by the game engine framework for creating their own game.

H3: Developers should easily download the game engine .exe and players should easily download games from the website.

**Success of Dark Pattern Game.**

H4: Players of the Dark Patterns game were able to grasp a better understanding of what dark patterns are through our dark patterns game.

# **2. Experimental Method**

## **2.1 Overview (200 words)**

How will you run your experiment? What will the experimental conditions be? What is your overall experimental design? What are the baselines you compare against and the evaluation metrics?

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The experimental process for user evaluation will consider a set of cognitive walkthroughs with qualitative open-ended questions after based on the user tasks. We did several online and in person meetings to conduct the experiments.

## **2.2 Data Collection (100 words)**

What data will you collect during the experiment about participants’ performance and why? Will there be a mix between subjective (qualitative) and objective (quantitative) measurements? How does the data you will collect relate directly to your experimental hypothesis?

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The user evaluation of this project will use a set of cognitive walkthroughs and open-ended questions of qualitative nature. This will be a subjective process to gain a clearer understanding of how a user faired in their tasks and give them the opportunity to discuss some aspects they liked and disliked about the project. When it comes to learning a new topic, it can be subjective to the individual, we hope to tap into this and reveal insights as to how we can improve our process to make game development easier for aspiring enthusiasts and increase awareness of dark patterns to surfers of the web.

Cognitive walkthroughs are a user evaluation method used to examine the usability of a product. It lies in contrast to heuristic evaluation by seeking users to evaluate the product. The idea suggests that the user is expected to carry out a given set of tasks. These tasks will then be assessed and examined for usability (Interaction design foundation, 2021). The assessors of the user evaluation can also take note of Blackmon et al. (2002, as cited in Interaction design foundation, 2021) to keep in mind 4 questions while carrying out the cognitive walkthroughs:

1. Will the user try and achieve the right outcome?
2. Will the user notice that the correct action is available to them?
3. Will the user associate the correct action with the outcome they expect to achieve?
4. If the correct action is performed, will the user see that progress is being made towards their intended outcome?

Qualitative questions will be used in conjunction with corresponding cognitive walkthrough task sets. We aim to loosen the process with a semi-structural, open-ended style of questioning to help gauge the user's overall impression of the product and capture any subjective insights that were missed at the cognitive walkthrough stage. We aim to promote two-way back and forth communication in this process.

In Nielsen (2022), he discusses how ‘Heuristic evaluation involves having a small set of evaluators examine the interface and judge its compliance with recognized usability principles (the "heuristics")’. In this project we aim to ask some usability experts to judge this compliance with usability heuristics, adding this extra scope of evaluation to our user evaluation comparing to the cognitive walkthrough mentioned above.

## **2.3 Selected Subjects (100 words)**

Who will you use as subjects in your experiment. Why are these a representative sample? How will you source these subjects?

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As there are a few different aspects of the project that needed to be tested we strived to select users of various demographics and skill levels in terms of programming ability. For the game engine itself we hope to conduct a cognitive walkthrough with users who have some level of coding experience and users with a more advanced coding skill set.

For the second task set, we are looking to select a sample of users of varying levels of knowledge of dark patterns, from no knowledge at all to UX experts.

To sum up the type of users we are looking for in our sample are the following:

1. A game developer with basic coding knowledge.
2. A games developer with more advanced coding knowledge.
3. Ordinary people who conduct online shopping with no knowledge of UX dark patterns.
4. UX experts who will be familiar with dark patterns and how they are integrated into websites.

It is with these types of users that we hope to gain insights into the usability and informativeness of our dark patterns game and the game engine UI application.

In order to source these types of users we asked friends and family to fill in as users, we can see in the matrix below how the people we asked to step in match the demographic qualities to the users above. We also made sure to link their characteristics to our chosen personas.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Demographic | Interview method | Age | Game | Game engine | Website | Matching Persona  Type and user Journey |
| UX designer | Expert review  Qualitative | 28 | Tested game prototypes | Tested game engine UI application  prototype | Tested website  prototypes | Persona 3, User Journey 3 |
| UX designer | Expert review  Qualitative | 33 |  |  |  | Persona 3, User Journey 3 |
| Software developer | Expert review  Qualitative | 34 |  |  |  | Persona 1, persona 2  User Journey 1, user Journey 2 |
| Gamer / Game developer | Expert review  Qualitative | 27 |  |  |  | Persona 1, persona 2, user Journey 1, User Journey 2 |

Need to add users to this

## **2.4 Data Analysis (200 words)**

How will you analyse the data you collect during the experiment? How will this analysis answer the question you originally proposed?

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## **2.5 Practical Setup (200 words)**

In practical terms how will you run your experiment? Will it be online or offline? What instructions will participants be given? What type of room/environment will the experiment be in? Will questions/surveys be displayed on-screen or on

printed paper?

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# **3. Conclusions (200 words)**

What can you conclude after running this evaluation study (e.g., will you learn anything useful about the quality of your solution)? What could be done better in a future evaluation study (e.g., would you like to ask different questions or use different evaluation metrics)?

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This user evaluation segment analysed the performance of a group of selected users given a set of tasks to conduct on playing a dark patterns game and using the horizon game engine UI application to create a simple game.

Due to the scope of this project, we elected not extend the user evaluation to analyse users creating their own UI application from the API framework built into the Horizon game engine. In future analysis of this project, we hope to investigate this area more to see if we can analyse a set of tasks surrounding the building of a new game engine UI application using the horizon game engine API framework.

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# **References**

Provide complete bibliographic detail for any cited work.