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PERCEIVED USABILITY EVALUATION OF GAMEDEV FTI UNTAR'S WEBSITE AS ASSET DATABASE USING SYSTEM USABILITY SCALE

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ABSTRACT

Game Development (GameDev) is one of the specializations from Informatics Engineering Major, Faculty of Information Technology, Tarumangara University (FTI Untar). In order to address the issue raised by GameDev FTI Untar's earlier research, a website with three separate user types—admin, student, and guest—was created using the Software Development Life Cycle Prototype model. This website must now be tested to be able to be implemented in GameDev FTI Untar. The System Usability Scale was used as a tool to rate the usability of Gamedev FTI Untar's website in this study. The website's usability level is used to assess its readiness for implementation. The System Usability Scale is utilized due to the research's timing constraints. The results of the test were excellent, with an aggregate rating of 89.71 points out of 100, which is considered "A+" in the curved grading scale. Because the goal has been achieved, there will be no more testing in the future for GameDev FTI Untar's website. The website can be implemented and ready for usage.

Keywords: *Website Development, Perceived Usability Evaluation, System Usability Scale*

1. INTRODUCTION

FTI Untar was officially open since January 1st, 2002. Informatics Engineering Major from FTI UNTAR successfully got "A" accreditation on 2020 and made the major became Indonesia's one of the best major in private college. The major has few specializations, and one of it is Game Development where the alumnus is expected to be a game developer using a certain programming language for publication. GameDev FTI Untar once has a difficulty to store assets data and GameDev FTI Untar's alumnus thesis data, where GameDev FTI Untar used cloud with unlimited space, but suddenly the provider changes the policy and GameDev FTI Untar is no longer had the access to the unlimited space of cloud storage. A website with 3 different types of users (admin, student, guest), was developed using Software Development Life Cycle Prototype model and now needs to be tested.

Usability is the target in the research of GameDev FTI Untar's website development. According to the International Organization for Standardization – ISO 9241-11:1998 it is stated that usability is defined as the degree to which a product is useful in helping consumers achieve their intended goals successfully, quickly, and satisfactorily [1]. This factor can also indicate whether or not a website's users find its appearance appropriate and appealing [2]. Therefore, global evaluation of the system usability is seen needed to successfully implement the website program to GameDev FTI Untar. By asking users of an application to score its usefulness after full and in-depth usage, standardized usability questionnaires created with the purpose of usability testing have been used to evaluate the usability of numerous consumer products [3], [4]. The System

Usability Scale is one of the regularly utilized instruments in the questionnaire technique to evaluating the usability of applications [5], [6].

This research was conducted to find out the level of usability of the Gamedev FTI Untar's website. The level of usability is used to determine whether the website is ready to be implemented. The System Usability Scale is utilized due to the research's timing constraints. To complete the user's knowledge about the website before filling the System Usability Scale questionnaire, User Acceptance Test using Black Box Testing Method was concluded before this test. The result was that the users successfully completed the tasks given: 86 admin tasks, 16 student tasks, and 10 guest tasks [7]. Therefore, the System Usability Scale (SUS) can be conducted.

2. RESEARCH METHOD

SUS is among the most often used tools for gauging perceived usability in surveys and research pertaining to usability [8]. John Brooke developed the System Usability Scale in 1986. Designers may assess a wide range of goods and services, including hardware, software, mobile devices, websites, and apps, using the System Usability Scale. Participants were asked to score the following 10 items on the System Usability Scale with one of five responses, ranging from Strongly Agree until Strongly Disagree, as shown in Figures 1 and 2., [9], [10].

1. I think I want to use this system a lot.
2. I find the system unnecessarily complicated.
3. I think the system is easy to use.
4. I think I need support from a technical person to be able to use this system.
5. I found the various functions in this system well integrated.
6. I think there are too many inconsistencies in this system.
7. I imagine most people will learn to use this system very quickly.
8. I found this system very complicated to use.
9. I feel very confident using the system.
10. I need to learn a lot of things before I can use this system.

Figure 1. System Usability Scale Questionnaire
Source: Personal Documentation

Figure 2. Scale 1 to 5 from System Usability Scale
Source: Personal Documentation

There are 10 components of SUS in total, of which half (the odd number of items) are positive and the other half (the even number of items) are negatives (the even number items). Responses are given to each query on a scale of 1 (strongly agree) to 5 (strongly agree). The SUS score

ranges from 0 to 100 in 2.5-point increments, with a higher number suggesting better usability. SUS scoring rules based on Jeff Sauro can be seen in Figure 3.

1. For odd items: subtract one from the user response.
2. For even-numbered items: subtract the user responses from 5
3. This scales all values from 0 to 4 (with four being the most positive response).
4. Add up the converted responses for each user and multiply that total by 2.5. This converts the range of possible values from 0 to 100 instead of from 0 to 40.

Figure 3. SUS Scoring Rules
Source: Personal Documentation based on Jeff Sauro

The average SUS score across all 500 research, according to Sauro's analysis of 500 studies, is 68. Anything considered to be above average would have a SUS score of 68 or higher, while anything considered to be below average would have a score of 68 or less. Figure 4 shows how the percentile ranks associate with SUS scores and letter grades [10]. Curved Grading Scale (CGS) approach is used in this research to analyze the SUS scores. The CGS grading system is recognized as credible since it is based on data from 446 usability tests that include more than 5000 fully completed SUS questionnaires [11]. The curved grading scale can be seen in Figure 5.

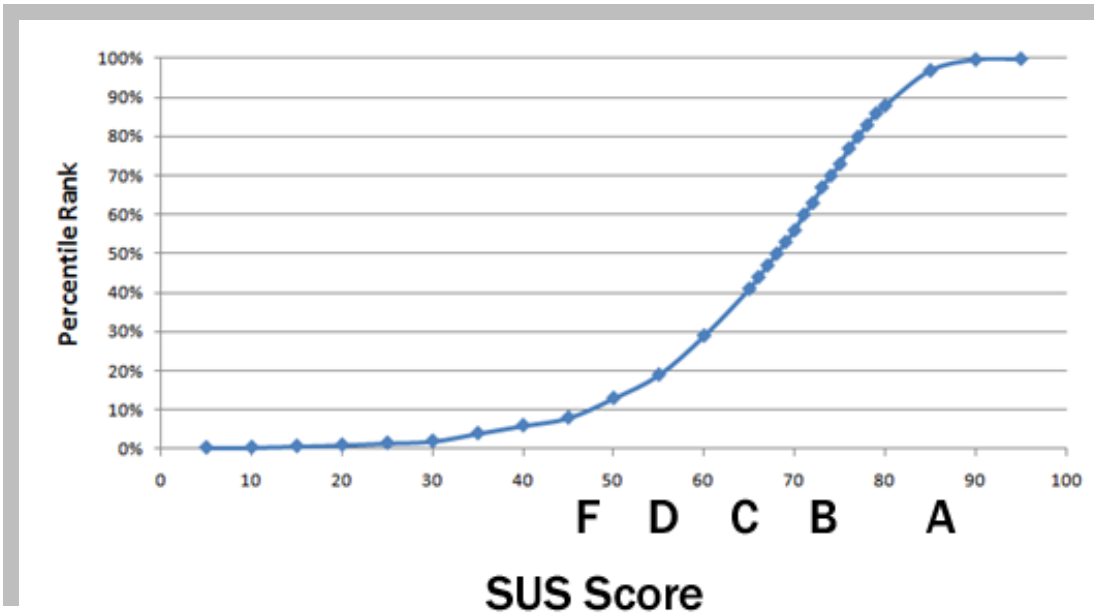


Figure 4. Percentile Ranks Association with SUS Scores and Letter Grades
Source: (Sauro, 2011)

Range of SUS Score	Grading	Percentile Range
84.1–100	A+	96–100
80.8–84.0	A	90–95
78.9–80.7	A−	85–89
77.2–78.8	B+	80–84
74.1–77.1	B	70–79
72.6–74.0	B−	65–69
71.1–72.5	C+	60–64
65.0–71.0	C	41–59
62.7–64.9	C−	35–40
51.7–62.6	D	15–34
0.0–51.6	F	0–14

Figure 5. CGS Grading System
Source: (Pal & Vanijja, 2020)

3. RESULTS AND DISCUSSIONS

The System Usability Scale is done right after User Acceptance Test on December 8th, 2023 so that the user had the minimum knowledge about the website by trying the website. The research was focused on desktop site, so the users only tried out the desktop site of the website. System Usability Scale is done by giving the questionnaire paper out to the users and let them fill out the scale. Because the website had a strict rule on who can access it, testing is done with small number of testers, that is one for each website side (admin, student, and guest). Figure 6-12 is the sample of website's user interface that users test. Figure 13 is samples from the System Usability Scale that was filled by the admin user. The documentation of the testing can be seen in Figure 14. The final average score is calculated afterwards using the rules.

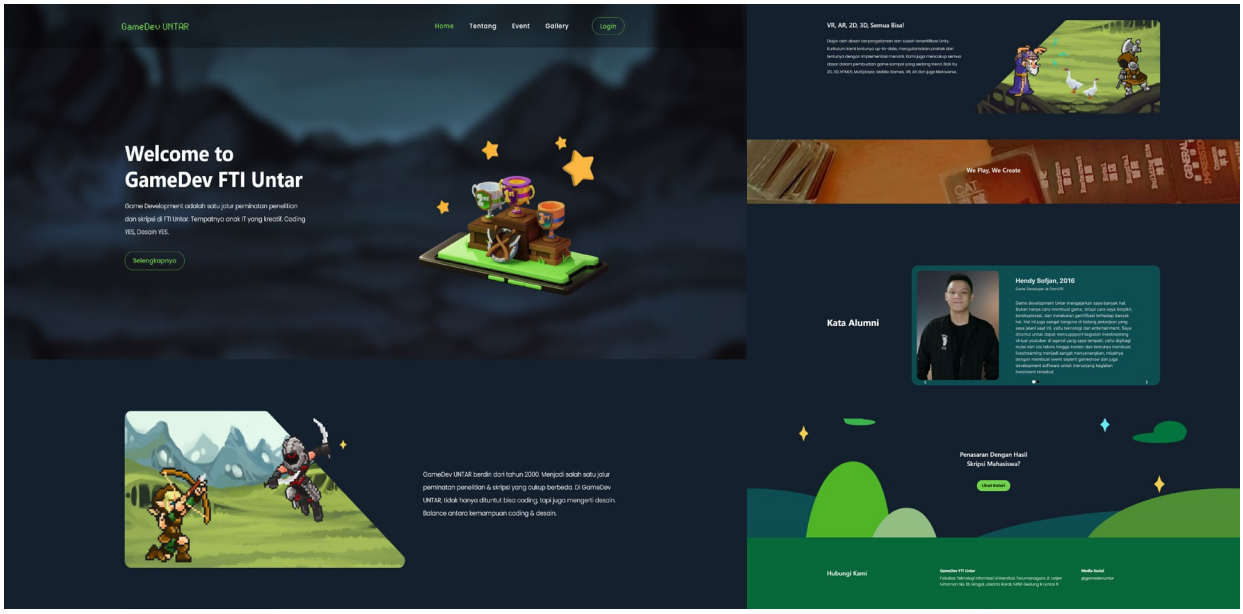


Figure 6. Developed Main Menu (Guest User)
Source: Personal Documentation

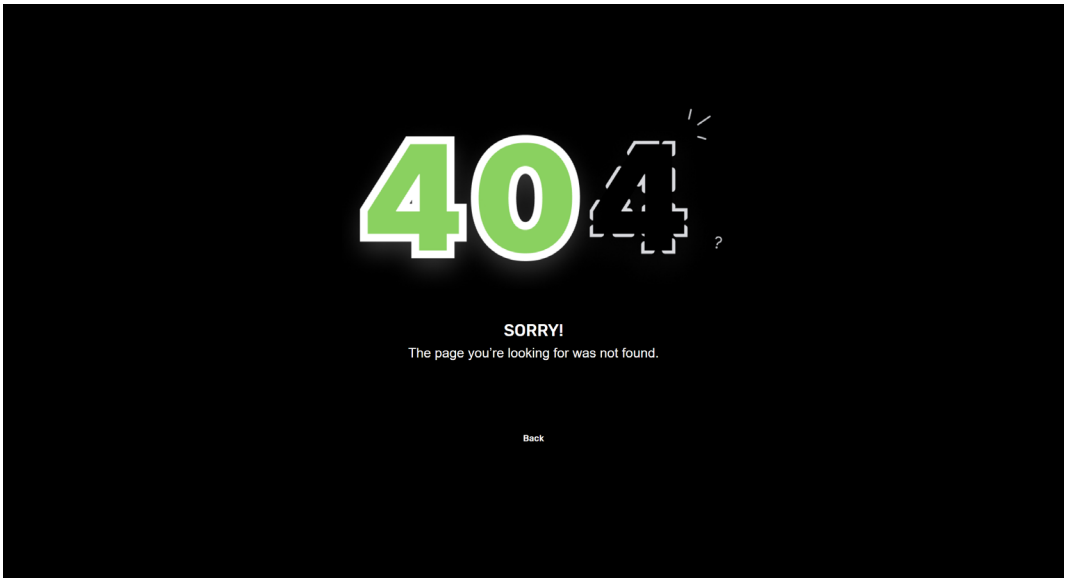


Figure 7. 404 Page (Guest User)
Source: Personal Documentation

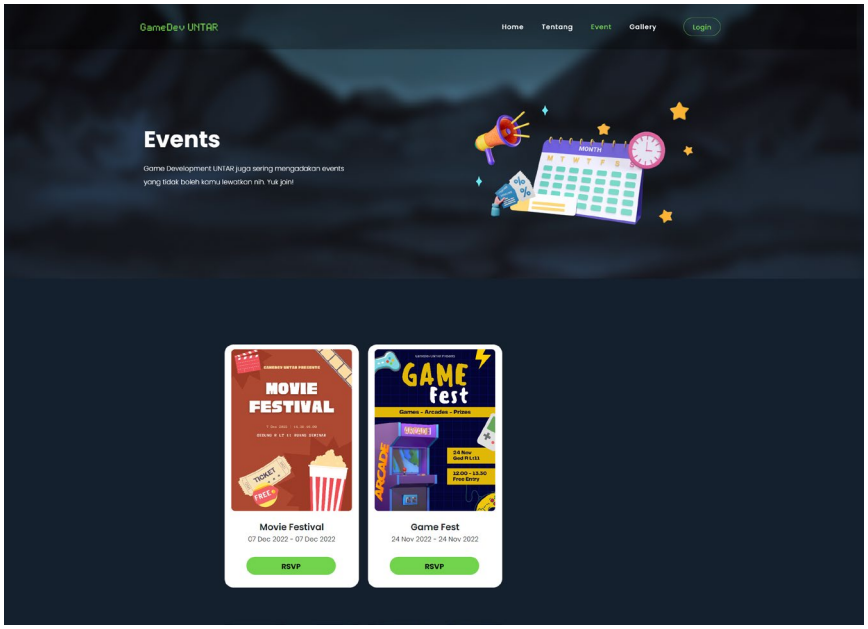


Figure 8. Events Page (Guest User)
Source: Personal Documentation

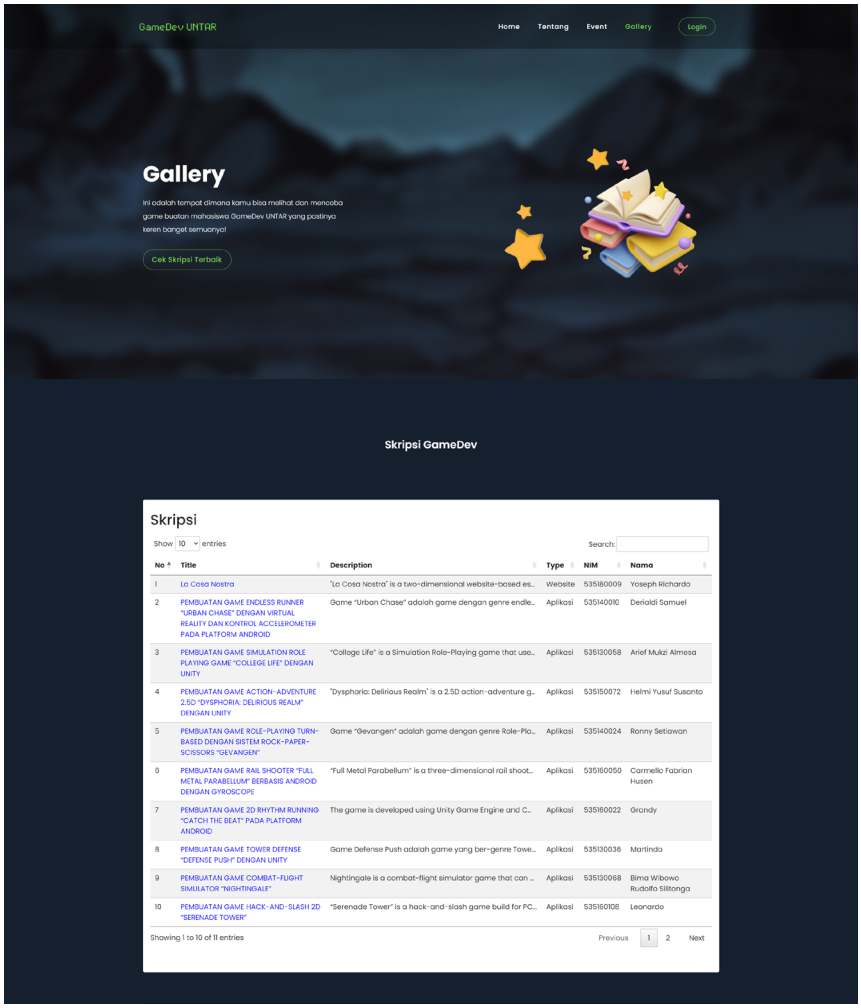


Figure 9. Gallery Page (Guest User)

Source: Personal Documentation

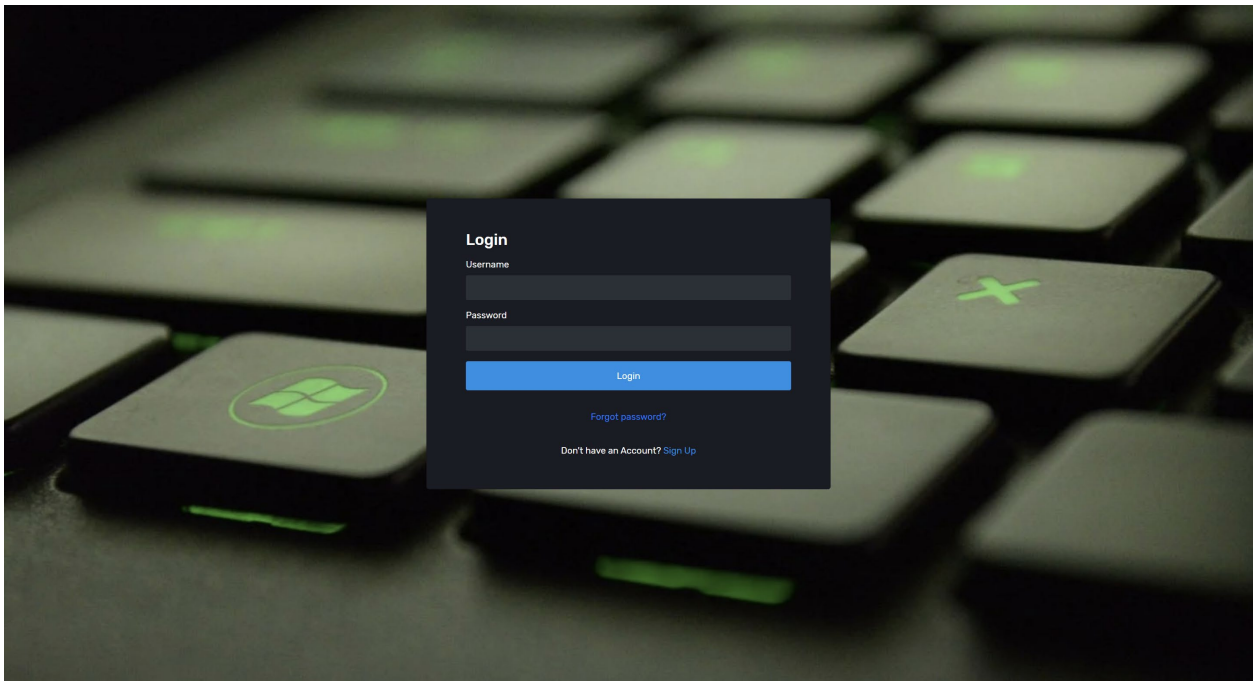


Figure 10. Login Page (Guest User)
Source: Personal Documentation

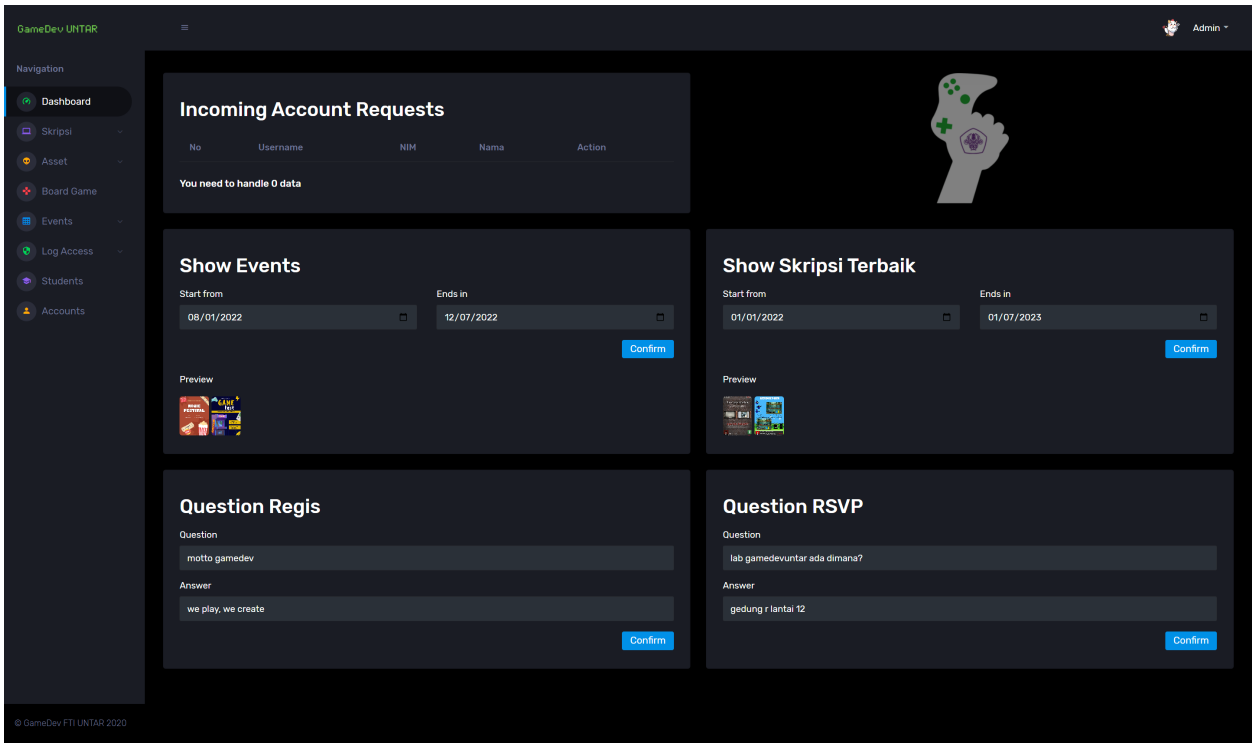


Figure 11. Dashboard Page (Admin User)
Source: Personal Documentation

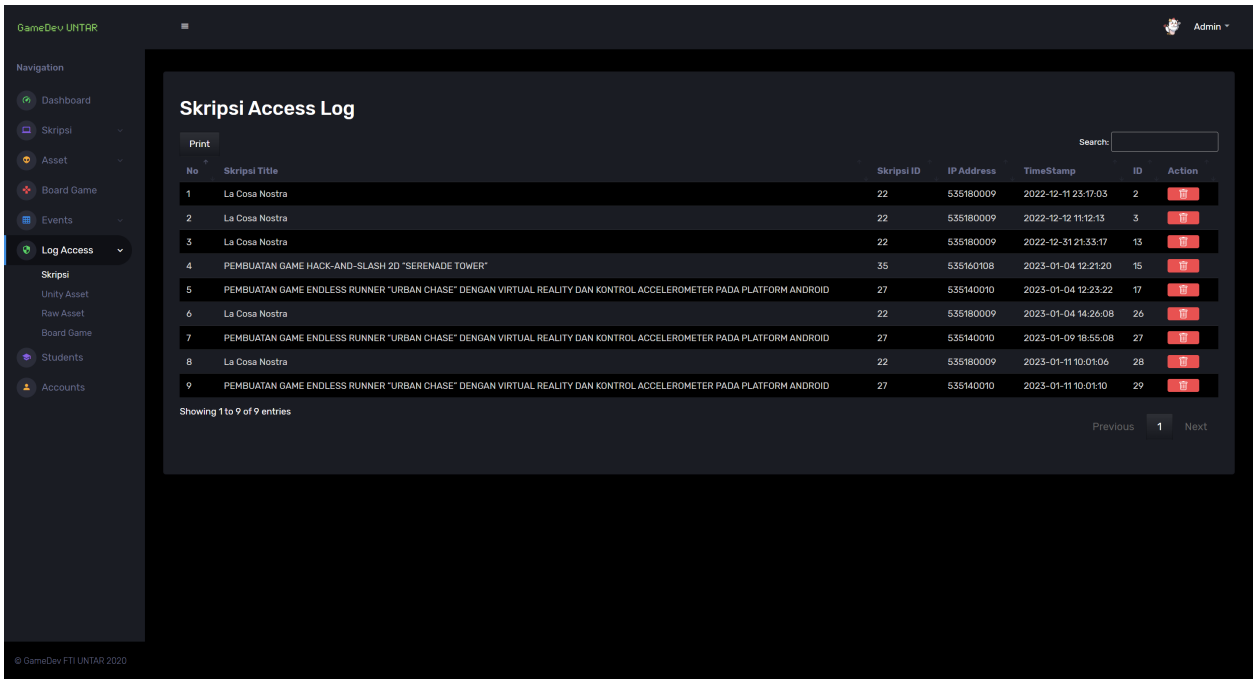


Figure 11. Access Log Page (Admin User)
Source: Personal Documentation

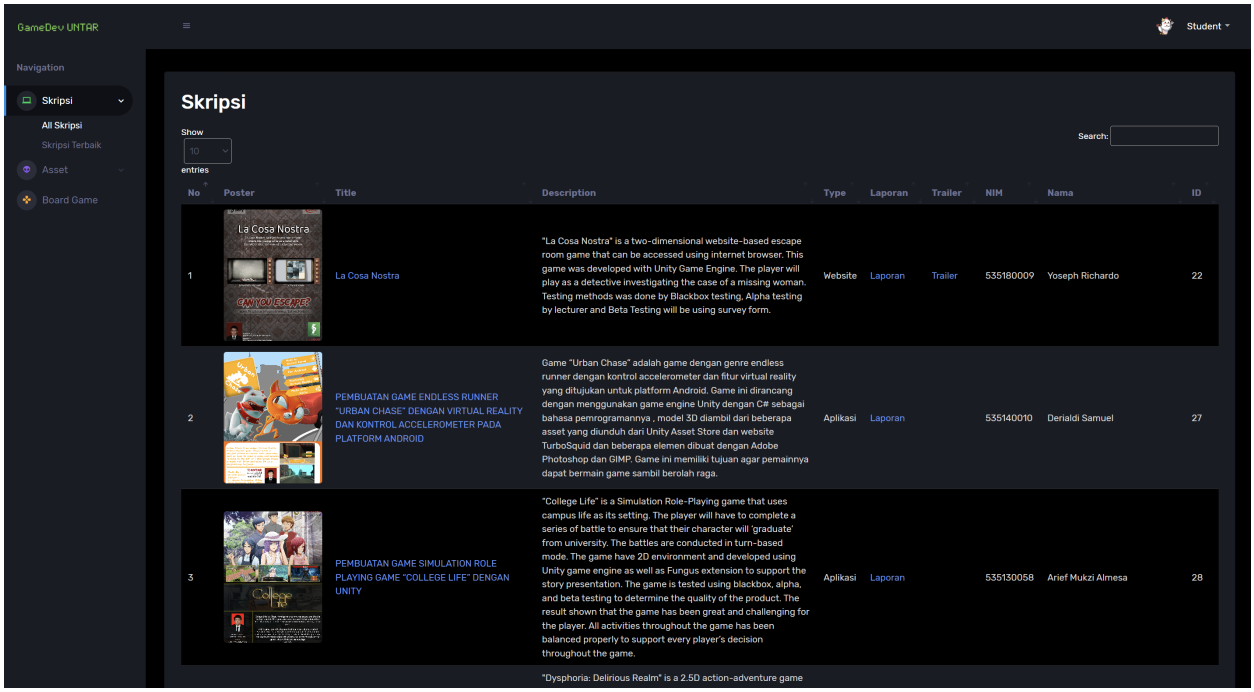
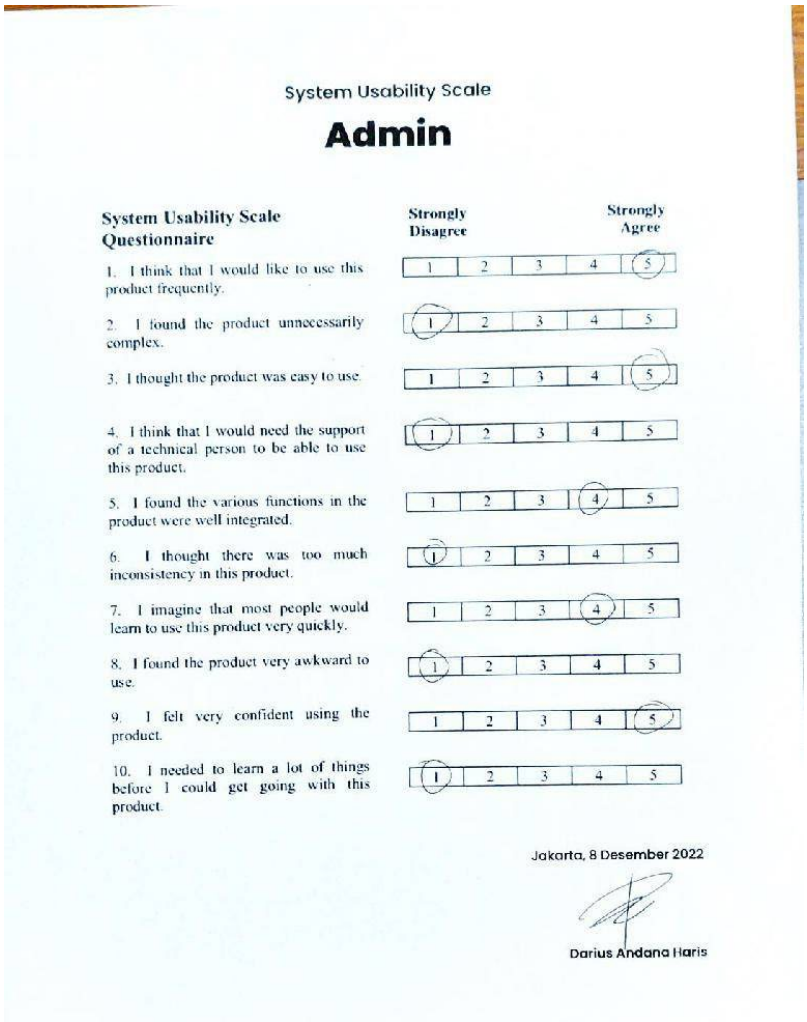


Figure 12. Thesis Page (Student User)
Source: Personal Documentation



System Usability Scale

Admin

System Usability Scale Questionnaire	Strongly Disagree				Strongly Agree
1. I think that I would like to use this product frequently.	1	2	3	4	(5)
2. I found the product unnecessarily complex.	(1)	2	3	4	5
3. I thought the product was easy to use.	1	2	3	4	(5)
4. I think that I would need the support of a technical person to be able to use this product.	(1)	2	3	4	5
5. I found the various functions in the product were well integrated.	1	2	3	(4)	5
6. I thought there was too much inconsistency in this product.	(1)	2	3	4	5
7. I imagine that most people would learn to use this product very quickly.	1	2	3	(4)	5
8. I found the product very awkward to use.	(1)	2	3	4	5
9. I felt very confident using the product.	1	2	3	4	(5)
10. I needed to learn a lot of things before I could get going with this product.	(1)	2	3	4	5

Jakarta, 8 Desember 2022

Darius Andana Haris

Figure 13. Filled SUS Questionnaire (Admin User)
Source: Personal Documentation

Figure 14. User Acceptance Test and SUS Documentation
Source: Personal Documentation

The following is the SUS computation. For items 1, 3, 5, 7, and 9, the score contribution is equal to the scale position minus one. For items 2, 4, 6, 8, and 10, the score contribution is 5 less than the scale position. The SU's total score is calculated by multiplying the sum of the points by 2.5. Based on the test results, it can be concluded that the 3 sides of the website are successful and seen suitable by the users. Users can understand the website well and accept the website fully. In the SUS questionnaire, all three sides of the website got pretty good points, with an average of 89.17 points from the maximum that could be obtained, which was 100 points. By the CGS grading system, the website got "A+" score. It can be concluded that the website has met the target points, namely good usability and a website that is easy for users to use.

4. CONCLUSIONS AND SUGGESTIONS

Because that the users already tested the website by Black Box Testing in User Acceptance Test, filling out the SUS questionnaire went fast. From the system usability testing using System Usability Scale, it can be concluded that the website is already seen as usable by the users. The website got an "A+", which is very excellent and suitable according to research objectives. Based on user feedback, one of the reasons behind the great results was obtained by Prototype SDLC, where requirements analysis and prototypes are presented to the user to make sure the website align with the user's needs. Because the goal has been achieved, there will be no more testing in the future for GameDev FTI Untar's website. The website can be implemented and ready for usage.

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