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USABILITY ANALYSIS OF VISUAL NOVEL GAMES USING THE USABILITY TESTING METHOD

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Abstract: Visual novel games are interactive fiction games featuring static images. Visual novel games focus on the story of one of the visual novel games that game lovers often play, namely the game The Sun Shine Over Us. This game tells about mental health among teenagers. The purpose of this research is to analyze the "The Sun Shine Over Us" game based on several criteria and the satisfaction of using the application by users. This study uses the system usability scale method to determine the level of satisfaction of this visual novel game player. The data used are players who have played and have never played a visual novel game totaling 17 people with the age category of 17-28 years. Based on the reviews from players who have played visual novel games, the results of this study can be concluded that the visual game "The Sun Shine Over Us" is interesting to play in terms of appearance, monetization and UI assessment.

Keywords: Visual Novel Game; Usability Testing Analysis; Game The Sun Shine Over Us

1. Introduction

In using an application that can be the main focus, namely regarding the User Interface (UI) and User Experience (UX), these two components are very important because they function to connect users with information contained in an application itself, making it easier for users to operate the application. . But it's a shame that nowadays there are many developers who carelessly upload or publish applications without thinking about UI and UX [1] . The UI or user interface display has the intention that it is an important part of a system or application. UI is part of the system that is used to interact directly with the user. Therefore, the design of the UI is one of the most influential attractions, especially for an Android device. This experience involves individual perceptions related to the benefits felt, and the convenience obtained. UX is very dynamic, over time the user's perception can change as the environment, habits and values change.

Visual novel games are interactive fiction games featuring static images [3] . Visual novels are described as games in which the player becomes the character interacting with other characters, often with stories [4] . Visual novel is also a game genre that generally has few elements of gameplay and focuses mostly on stories [5]. Usually visual novels feature narrative and dialogue text in a box with character images and backgrounds.

In terms of benefits, visual novel games can be an alternative medium, because they have given novels in general a new potential which is not only in the form of visual content, but also has interactive content between the reader (players) and the story. This interactivity results in the freedom that novels and unique characters and backgrounds allow [4] . With these advantages and the process of integrating learning into visual novels, it is very possible for visual novels to attract players' interest in developing their creative side. One of the visual novel games is the game "The Sun Shine Over Us". This game tells about the conflict between teenagers which is interesting to play.

2. Materials and Methods

2.1 Analysis

According to Sugiyono [6], data analysis is the process of searching and compiling data systematically. Data obtained from interviews, report notes and documentation, by organizing data into categories, describing them into units, synthesizing, compiling into patterns, choose which ones are important and which will be studied, and make conclusions so that they are easily understood by yourself and others.

2.2 Software

Software made by a computer company to do certain tasks, for example Microsoft Word, Microsoft Excel. The application comes from the word application which means the application of application usage. According to Jogiyanto quoted by [7] application is application, storing something, data, problems, work into a facility or media that can be used to apply or implement existing things or problems so that they turn into a new form without losing basic values in terms of data, problems, and the work itself. So the application is a transformation of a problem or work in the form of things that are difficult to understand to be simpler, easier and understandable for users. So that with the application, a problem will be helped more quickly and precisely. Applications have many types, including desktop applications that operate offline and web applications that operate online. A web application is an application that uses browser technology to run applications and is accessed via a computer network, Remick in his journal [7].

2.3 Story

Stories are essays that tell people's actions, experiences or suffering, how an event or incident happened, whether it really happened (fiction) or which was just fiction (non-fiction).

2.4 Game

Game is a system or program where one or more players make decisions through control of objects in the game for a certain purpose.[8] . Game comes from the English word which means the basis of the game. The game in this case refers to the notion of intellectual agility which can be interpreted as an arena for the decisions and actions of the players [9].

2.5 Visual Novel

According to Dzakwan Ahmad's explanation [14], Visual Novel is a genre of interactive fiction video games featuring text as the main element accompanied by static images which usually have an anime style as supporting elements. VN itself is very popular in Japan. This is the reason why many famous VN game series come from this cherry country. An example of a well-known VN game from Japan is the “Danganronpa Series” which invites you to uncover murders in a survival game, and don't forget the “Fate Series” which is also famous for its animated adaptation.

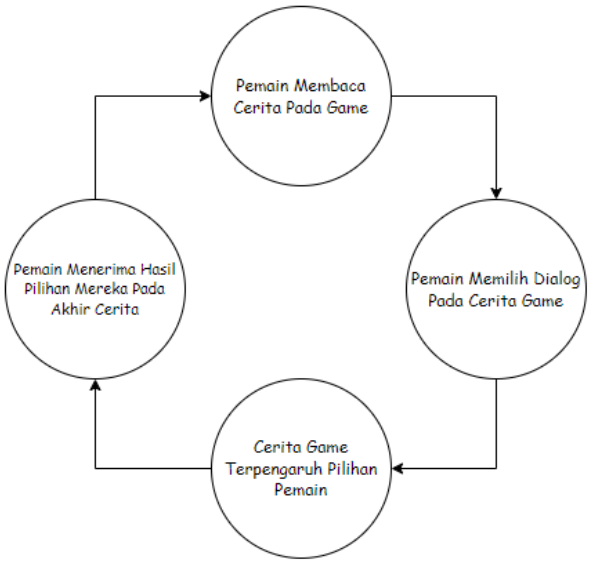


Figure 1. Visual Novel Gameplay Loop

2.5 The Sun Shine Over Us



The Sun Shine Over Us is a light game in the form of a visual novel. Players will play the role of a girl named Mentari who is a high school student in Jakarta who suffers from PTSD (Post traumatic Stress Disorder). Then, players will accompany youth problems around bullying and harassment. Players will also have dialogue with the protagonist and antagonist characters around Mentari.

Research manuscripts reporting large datasets that are deposited in a publicly available database should specify where the data have been deposited and provide the relevant accession numbers. If the accession numbers have not yet been obtained at the time of submission, please state that they will be provided during review. They must be provided prior to publication.

Intervention studies which are involving animals or humans, and other studies require ethical approval must list the authority that provided approval and the corresponding ethical approval code.

3. Results

Usability testing in this study used the system usability scale method createdby John Broke in 1986. There were 17 informants in this study with an age range of 17- 28 years old. The data collection method used the between subject technique, this was done because in this study there was nothing difference in data collection for each informant, so a System Usability Scale was needed to analyze player about satisfication in playing this game. SUS is only use to evaluate many kinds of products and services.

3.1. Validity Test and Reliability Test

3.1.1 Validity Test

Validity Testing of each question item is used by analyzing the items, namely correlating the score of each question item with the total score which is the sum of the question scores. The validity of the SUS questionnaire data instrument with the provisions that $r_{count} > r_{table}$ then the question item is declared valid and if the r_{cout} value is > r_{table} then the question item is declared invalid. The result of validity in this study is :

Statement	R_{count} Value	R Table Value	N	Conclusion
Statement 1	0.719**	0.482	17	Valid
Statement 2	0.502**	0.482	17	Valid
Statement 3	0.488**	0.482	17	Valid
Statement 4	0.620**	0.482	17	Valid
Statement 5	0.755**	0.482	17	Valid
Statement 6	0.629**	0.482	17	Valid
Statement 7	0.536**	0.482	17	Valid
Statement 8	0.738**	0.482	17	Valid
Statement 9	0.506**	0.482	17	Valid
Statement 10	0.770**	0.482	17	Valid

From the statistical test result above, it was found that all questions had $r_{count} > r_{table}$ = 0,482, so that all questions were declared valid.

3.1.2 Reliability Test

The instrument reliability test in this study the Alpha Cronbach technique. The test criteria are, if the reliability coefficient (ri) > 0.6, then it can be said that instruments is reliable. The results of the data analysis of the variables are as follow :

Reliability Statistics

Cronbach's Alpha[a]	Cronbach's Alpha Based on Standardized Items[a]	N of Items
1.023	.778	10

a. The value is positive due to a positive average covariance among items. This reliability model assumptions.

According the result of reliability test above, the alpha value was 1,023 > 0,06, so the research questionnaire was declared reliable. This means that the measuring instrument used in this study already has the ability to provide consistent measurement results in measuring the same symptpms.

3.2. System Usability Scale Results

Usability testing is the testing phase after testing the program. This test is carried out to measure the level of satisfaction with the use of the system that has been made by the user. The benefit of this usability test is one of being able to find out whether the development of system applications is in accordance with user needs or not, so that it becomes a benchmark for the success of application acceptance by related users. In this study, to find out how effective, eefficient and satisfying the program is made according to its use, usability testing is carried out. The program in this study in question is a visual novel game that is used by people who become informants. So that it will be known the level of satisfaction of respondents in using the game that was made.

In assessing the SUS score, it is divided into 2, namely the assessment of informants who have played the game and the assessment of informants who have never played the game.

3.2.1 Assessment of Informants Who Have Never Played the “Game Reaching for the Sun”

After adding up the SUS score, the informants SUS score then multiplied by 2.5 according to the SUS rules. The multiplucation results of the SUS score are shown in the table bellow :

Table. 1 Score SUS after multiplied 2.5

No	Informan	SUS Score	Skor SUS x 2.5
1	Informan 1	30	75
2	Informan 2	13	32.5
3	Informan 3	33	82.5
4	Informan 4	32	80

5	Informan 5	13	32.5
6	Informan 6	12	30
7	Informan 7	20	50
8	Informan 8	14	35
9	Informan 9	19	47.5
10	Informan 10	13	32.5
Jumlah		199	497.5

Based on the results of calculating the SUS score for each informant, it can be seen that the highest score obtained was 82.5 and the lowest score was 30. The median value of the SUS was 41.25, the value that occurs frequently was 32.5. The following is a graphical image of the distribution of informant SUS scores.

For further calculations, the SUS score of each informant is sought by the average score by adding up all the scores and diving by the number of users. The following formula calculates the SUS score :

$$\bar{x} = \frac{\sum x}{n}$$

Information :

$\bar{x}$ = average score

$\sum x$ = total SUS score

n = total informan

The total SUS score of the informants in this study was 497,5 as shown in table 1, which was obtained from 10 informants. Based on this formula, the average SUS score is obtained as follow :

$$\bar{x} = \frac{497,5}{10}$$

$$= 49,5$$

The results of the average value obtained are then correlated with the SUS score scale to determine the level of satisfaction in using visual novel games.

In interpreting the results of calculating the SUS score into the SUS score scale, an analysis is carried out using 5 ways :

a. Percentile Rank

SUS scores can be converted into percentile ratings. The score percentile rating is the percentage of scores in their frequency distribution that are equal to or lower than that. The following figure shows the percentiles for the SUS score threshold in general.

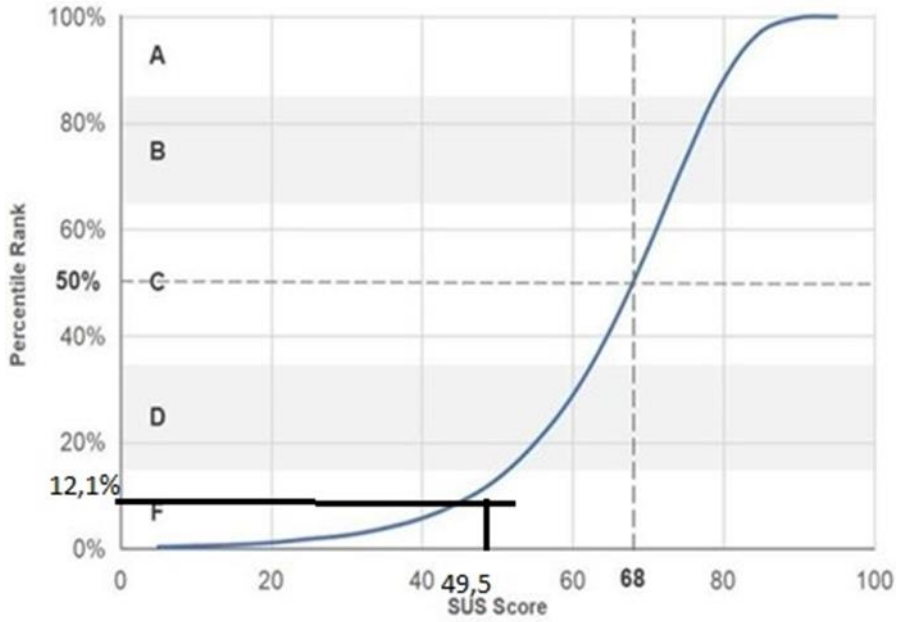


Figure 1. Score SUS in Percentile Curve

It is known that the average SUS score in general (at the 50th percentile) is 68. That means for SUS score above 68 above the average and below the averager. In this study, an SUS score of 49.5 was obtained (shown on the black line in the curve image above), if it is correlated with the general. This shows that the score of using visual novel games by informants in ranked 12.10%. Based on the scale of interpretation of the results of the SUS score according to Lewis shown in the table.

Table 2. SUS Score Interpretation of Results Scale

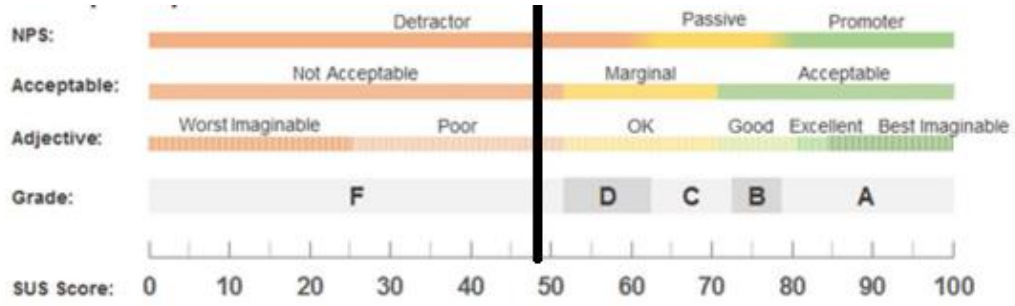
No	Grade	SUS	Percentile Rank
1	A+	84,1-100	96-100
2	A	80,8-84,0	90-95
3	A-	78,9-80,7	85-89
4	B+	77,2-78,8	80-84
5	B	74,1-77,1	70-79
6	B-	72,6-74,0	65-69
7	C+	71,1-72,5	60-64
8	C	65,0-71,0	41-59
9	C-	62,7-64,9	35-40

10	D	51,7-62,6	15-34
11	F	0-51,7	0-15

Based on the interpretation table above, it can be seen that the users of this visual novel game are in the very low category.

b. Grade, Adjective, Acceptability

Closely related to the interpretation of percentile rangking is grade. This type of scoring system is used to categorize SUS scores in the A-F grade range. In grade A, which shows superior performance, up to F (for failed performance), up to F (for failed performance), and C shows averge. The research grade in this study is shown in Figure 2.



The SUS score obtained in this study was 49.5 if it was correlated with the grade scale image above, it can be seen that it is in grade D which indicates the score is classified as low.

For the adjective test, the adjectives scale contains adjectives including such as “Good”, “Okay”, and “Bad”. For example, a SUS score above 85 is associated with “Very Good”, “Good” just above the average of 71 and “OK” for a score of 51. The SUS core in this study was 49.5 on the adjective scale classified as poor. It can be said that the use of this visual novel game is not good.

Another variation on describing SUS is through “ acceptable” or “unacceptable” statements specifying these conditions when SUS is well above average or far bellow above 70 (above the average SUS score pf 68) is categorized as acceptable and uacceptable below 50 (associated with a score lower than 51.5 with a value of D). score in the 50-70 range are defined as “marginally acceptable, covering the range from C to D on the rating scale. The SUS score obtained in this study was 49.5 which was categorized as Not Acceptable. Which means that this game was not accepted by the informants.

There is a consistently strong correlation between SUS and Net Promoter Score (NPS). The average SUS explains betweet 30% and 50% of the variation in a user’s likelihood and recommend. The NPS designates three classifications of recommenders based on their response to a possible 10 point (0-10). Promoter classification scores 9 and 10, passive classification scores 7 and 8, and detractors classification scores under 6. The SUS score in this study was 49.5 correlated with the NPS classification, so it it in the detractor classification. The informants in this study dislike the visual novel games that have been made.

Based on the results of the interpretation of the average SUS score obtained in this study,it can be seen in table 3 below :

Table 3. SUS Score Interpretation

Grade	SUS	Percentile Range	Adjective	Acceptable	NPS
A+	84,1-100	96-100	Best Imaginable	Acceptable	Promoter
A	80,8-84,0	90-95	Excellent	Acceptable	Promoter
A-	78,9-80,7	85-89	Good	Acceptable	Promoter
B+	77,2-78,8	80-84	Good	Acceptable	Passive
B	74,1-77-1	70-79	Good	Acceptable	Passive
B-	72,6-74,0	65-69	Good	Acceptable	Passive
C+	71,1-72,5	60-64	Good	Acceptable	Passive
C	65,0-71,0	41-59	OK	Marginal	Passive
C-	62,7-64,9	35-40	OK	Marginal	Passive
D	51,7-62,6	15-34	OK	Marginal	Passive
F	25-51,6	2-14,9	Poor	Not Acceptable	Detractor
F	0-25	0-1,9	Worst Imaginable	Not Acceptable	Detractor

The average SUS score for users of the visual novel game "Menggapai Matahari" was 49.5. The results of the interpretation show that the score is in grade F with the 12th percentile range. This classification shows that the informant thinks this game is not good and unacceptable. For the assessment using NPS, informants are detractor, this interpretation is supported by informants who are not good at using this game, so that the responses and feedback given by informants are not good.

3.2.2 Assessment of Respondents Who have played the Game Reaching for the Sun

After adding up the SUS score, the informants SUS score then multiplied by 2.5 according to the SUS rules. The multiplucation results of the SUS score are shown in the table bellow :

Table 4.Score SUS after multiplied 2.5

No	Nama	Skor SUS	Skor SUS x 2.5
1	Informan 1	38	95
2	Informan 2	34	85
3	Informan 3	37	92.5
4	Informan 4	37	92.5

5	Informan 5	34	85
6	Informan 6	32	80
7	Informan 7	33	82.5
Jumlah		245	612.5

Based on the results of calculating the SUS score for each informant, it can be seen that the highest score obtained was 95 and the lowest score was 80. The median value of the SUS score was 85, and the value that occurs frequently was 85.

Based on the results of calculating the SUS score for each informant, it can be seen that the highest score obtained was 82.5 and the lowest score was 30. The median value of the SUS was 41.25, the value that occurs frequently was 32.5. The following is a graphical image of the distribution of informant SUS scores.

For further calculations, the SUS score of each informant is sought by the average score by adding up all the scores and diving by the number of users. The following formula calculates the SUS score :

$$\bar{x} = \frac{\sum x}{n}$$

Information :

$\bar{x}$ = average score

$\sum x$ = total SUS score

n = total informan

The total SUS score of the informants in this study was 497,5 as shown in table 1, which was obtained from 10 informants. Based on this formula, the average SUS score is obtained as follow :

$$\bar{x} = \frac{612,5}{7}$$

$$= 87,5$$

The results of the average value obtained are then correlated with the SUS score scale to determine the level of satisfaction in using visual novel games.

In interpreting the results of calculating the SUS score into the SUS score scale, an analysis is carried out using 5 ways :

c. Percentile Rank

SUS scores can be converted into percentile ratings. The score percentile rating is the percentage of scores in their frequency distribution that are equal to or lower than that. The following figure shows the percentiles for the SUS score threshold in general.

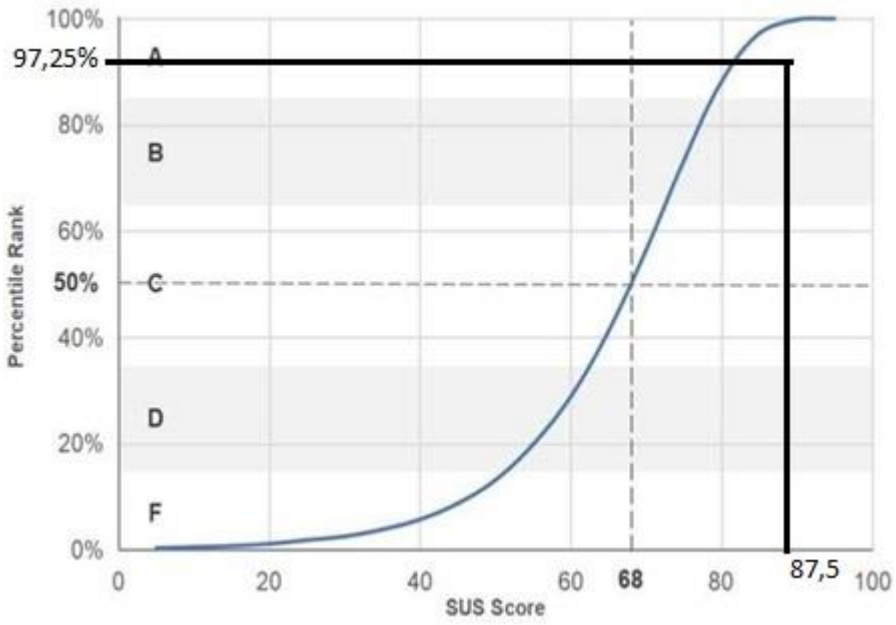


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It is known that the average SUS score in general (at the 50th percentile) is 68. That means for SUS score above 68 above the average and below the averager. In this study, an SUS score of 49.5 was obtained (shown on the black line in the curve image above), if it is correlated with the general. This shows that the score of using visual novel games by informants in ranked 97.25%. Based on the scale of interpretation of the results of the SUS score according to Lewis shown in the table.

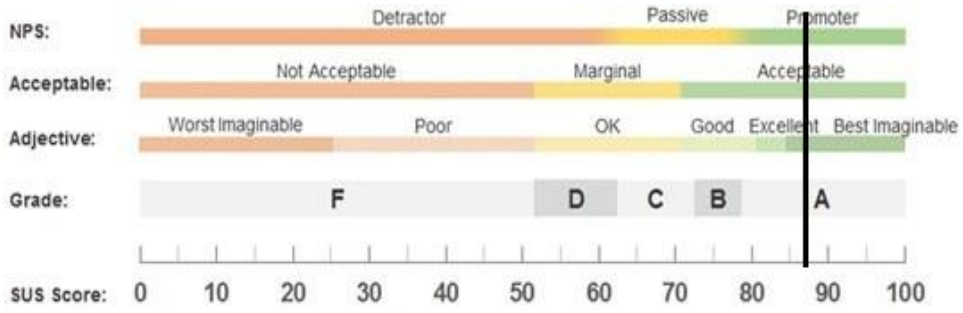
Table 2. SUS Score Interpretation of Results Scale

No	Grade	SUS	Percentile Rank
1	A+	84,1-100	96-100
2	A	80,8-84,0	90-95
3	A-	78,9-80,7	85-89
4	B+	77,2-78,8	80-84
5	B	74,1-77,1	70-79
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8	C	65,0-71,0	41-59
9	C-	62,7-64,9	35-40
10	D	51,7-62,6	15-34
11	F	0-51,7	0-15

Based on the interpretation table above, it can be seen that the users of this visual novel game are in the very high category.

d. Grade, Adjective, Acceptability

Closely related to the interpretation of percentile rangking is grade. This type of scoring system is used to categorize SUS scores in the A-F grade range. In grade A, which shows superior performance, up to F (for failed performance), up to F (for failed performance), and C shows averge. The research grade in this study is shown in Figure 3.



The SUS score obtained in this study was 87.5 if it was correlated with the grade scale image above, it can be seen that it is in grade a which indicates the score is classified as Excellent .

For the adjective test, the adjectives scale contains adjectives including such as “Good”, “Okay”, and “Bad”. For example, a SUS score above 85 is associated with “Very Good”, “Good” just above the average of 71 and “OK” for a score of 51. The SUS core in this study was 87.5 on the adjective scale classified as poor. It can be said that the use of this visual novel game is best imaginable .

Another variation on describing SUS is through “ acceptable” or “unacceptable” statements specifying these conditions when SUS is well above average or far bellow above 70 (above the average SUS score pf 68) is categorized as acceptable and uacceptable below 50 (associated with a score lower than 51.5 with a value of D). score in the 50-70 range are defined as “marginally acceptable, covering the range from C to D on the rating scale. The SUS score obtained in this study was 87.5 which was categorized as Acceptable. Which means that this game was accepted by the informants.

There is a consistently strong correlation between SUS and Net Promoter Score (NPS). The average SUS explains betweet 30% and 50% of the variation in a user’s likelihood and recommend. The NPS designates three classifications of recommenders based on their response to a possible 10 point (0-10). Promoter classification scores 9 and 10, passive classification scores 7 and 8, and detractors classification scores under 6. The SUS score in this study was 87.5 correlated with the NPS classification, so it it in the promoter classification. The informants in this study dislike the visual novel games that have been made.

Based on the results of the interpretation of the average SUS score obtained in this study,it can be seen in table 3 below :

Table 3. SUS Score Interpretation

Grade	SUS	Percentile Range	Adjective	Acceptable	NPS
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B	74,1-77-1	70-79	Good	Acceptable	Passive
B-	72,6-74,0	65-69	Good	Acceptable	Passive
C+	71,1-72,5	60-64	Good	Acceptable	Passive
C	65,0-71,0	41-59	OK	Marginal	Passive
C-	62,7-64,9	35-40	OK	Marginal	Passive
D	51,7-62,6	15-34	OK	Marginal	Passive
F	25-51,6	2-14,9	Poor	Not Acceptable	Detractor

The average SUS score for users of the visual novel game "Menggapai Matahari" was 87.5. The results of the interpretation show that the score is in grade A+ with the 97 th percentile range. This classification shows that the informant thinks this game is excellent and acceptable. For the assessment using NPS, informants are promoter , this interpretation is supported by informants who are very good at using this game, so that the responses and feedback given by informants are very good.

4. Discussion

The writing of the dialogue is good, but the storyline that is too fast makes the ending of the story unclear and less strong. Apart from the fast storyline, another shortcoming is the ending of each chapter. After playing it, it can be seen that the ending of each chapter feels so fast and hangs. can still be said to be unclear and hanging. But it could be that this is reasonable because it can be used by game developers to attract the interest of players to continue the game story, but it can also have fatal consequences by not arousing the interest of players who are impatient with the main story of the game Reaching for the Sun. So it can be concluded that the writing of dialogue for each chapter in the game is quite good, and the story writing for each chapter is sufficient, but with a pace that might be reduced so that it is not too fast and the ending of the story in the game is not clear and seems hanging so it is less interesting for played.

In the Monetization section, what is used in this study consists of diamonds and tickets, so it is needed to analyze in-game monetization and player perceptions of the game Reaching for the Sun. Monetization analysis is used to analyze whether the game's monetization system is a barrier to buying the next chapter, to find out the price diamonds are too expensive or not and ticket purchases are too expensive or not.

After playing this game, you can be sure that the price of currency in the game Reaching for the Sun is not too high and monetization is not a barrier for Top-Ups so that you can continue the progress of the game Reaching for the Sun, but the large number of advertisements in each game session when played online reduces interest. as well as the currency conversion system in the game makes things like turning diamonds into tickets unprofitable because there is a daily login system where players can get tickets to buy the next chapter. The use of Diamonds is better used to store CG from several events in the game because it can used as an Achievement for the players. This is corroborated by statements from several informants who said that in their interview excerpts monetization was not a barrier and ticket and diamond prices were relatively cheap and affordable. Then there are those who in their interview excerpts said that there are still too many advertisements and it annoys players and buying ticket prices using diamonds he is not interested because of the daily login system contained in the game.

In the analysis of the User Interface it can be said that the game is User Friendly and easy to understand for players, starting from the buttons used on the UI to the location of the buttons in the game that should be in place, this has followed the standards of Visual Novel games in general.This was corroborated by the support of 3 main informants interviewed regarding the user interface of the game Menggapai Matahari, Informant 1 in his interview excerpt said that what the game offered was good enough that he was used to using UI like this in Visual Novel games in general and he had no difficulty to find the settings button or something else.Informant 2 in his interview excerpt also said that he had no difficulty finding buttons and menus in the game. According to informant 2 this game is quite user friendly and overall informant 2 feels quite satisfied with what has been given to this game. Informant 3 in his interview excerpt added that in terms of the user interface this game is user friendly and according to him the UI is a standard and simple UI for Visual Novel games in general, and in playing it the informant has no difficulty in finding settings buttons and the like.

5. Conclusions

In the UI analysis the player's response is quite good and users find no difficulties in playing the game, in the monetization analysis the game users are still unsatisfied, while for the storyline analysis the users respond well when playing the game.

Acknowledgments

Special thanks to those who helped me in completing this research with the hope that this research can be useful in the future, especially to determine the level of player satisfaction in playing a game.

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