

The Development of Borneo Wildlife Game Platform

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Abstract—Games are a unique, interesting, and fun entertainment medium. Games can contain education, introduction to certain flora and fauna, work and daily life, intelligence and dexterity. The game built in this study aims to introduce the flora and fauna found in the forests of East Borneo (Kalimantan), Indonesia as the object of a platform game. Games are built using the Game Development Life Cycle method in order to make good and organized games. The GDLC method contain 6 stages, first is the initiation for the initial idea, second is to preproduction for the asset creation, third stage is production for the system creation, fourth is the testing for the trial, fifth is the beta for the external trial, and the sixth stage is to release for publication. The results of the study resulted in the Borneo Wildlife game platform. This game introduces the unique flora and fauna in East Borneo, Indonesia, such as Black Orchids, Ironwood trees, Proboscis monkeys, Mahakam dolphins and Hornbills, as well as how to protect and preserve their nature. The game received 46 downloads from March 1, 2021 to May 24, 2021.

Keywords—Game development; Kalimantan; Borneo; wildlife game

I. INTRODUCTION

The island of Borneo (Kalimantan) is one of the five largest islands in Indonesia, in addition to the island of Sumatra, the island of Sulawesi, the island of Java and the island of Papua. The island of Kalimantan or internationally known as Borneo, is the third largest island in the world, with an area of 748,168 km². The island of Borneo is surrounded by the South China Sea to the west and north-west, the Sulu Sea to the north-east, the Sulawesi Sea and Makassar Strait to the east and the Java Sea and the Karimata Strait to the south. On the island of Borneo there are 3 countries; Indonesia (73%), Malaysia (26%) and Brunei Darussalam (1%). The Indonesian provinces of North Kalimantan, South Kalimantan, East Kalimantan, West Kalimantan, and Central Kalimantan make up the southeastern part of the island [1-4].

The island of Borneo is dominated by tropical rain forests. In fact, in the midst of rampant deforestation, as much as 50% of the Kalimantan area is still a tropical rain forest area. Local problems that exist on the island of Kalimantan are illegal logging, forest fires and poaching of protected animals [3-4]. So in the design of this game, besides aiming to introduce flora and fauna, it also teaches the community how to protect the forest and protect the wildlife in it from damage and poachers. This is the map of Kalimantan shown in Fig. 1.

In this study, Game application was chosen to introduce the natural wealth on the island of Borneo. The game application was chosen because it is interesting, many users from the

younger generation like it, and it is a fun learning media to introduce the unique flora and fauna on the island of Borneo, for example hornbills, Mahakam dolphins, black orchid flowers, Ulin trees, orangutans and long nosed monkeys or proboscis monkeys [3-8]. All the uniqueness of the flora and fauna can be used as the object of the story, can be introduced to the world and can make local games more interesting. In the Fig. 2 we can see Hornbills, Proboscis monkeys, Black Orchid flowers, Ulin trees, and Mahakam dolphins as Gallery Item.



Fig. 1. The Map of Kalimantan (Borneo) [2].



Fig. 2. Hornbills, Proboscis Monkeys, Black Orchid, Ulin Trees, and Mahakam Dolphins.

The purpose of this research is to produce a game with the platform "Borneo Wildlife" with the theme of flora and fauna of Borneo and the application of the Game Development Life Cycle method (GDLC) method. This method is used to develop games with a standard flow of game development in general, starting from the planning process to the release process to

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make it easier to produce or develop a game [9-12]. The details methodology steps to develop this game presented in Section II, which has 6 stages, namely initiation for the initial idea stage, preproduction for the asset creation, production for the system development, testing for the internal tester, beta for the external tester, and release for the game publication [9-12]. Section III focuses on result and discussion for this research. Furthermore, the game application testing explained in details in Section IV. The last Section is Section V is for conclusion and future works of this study.

II. RESEARCH METHODOLOGY FOR GAME DEVELOPMENT

The method used in this study is the Game Development Life Cycle method which has 6 stages, namely 1) initiation for the initial idea stage, 2) preproduction for the asset creation stage, 3) production for the manufacturing stage system, 4) testing for the trial phase, 4) beta for the external trial phase, and 5) release for the publication phase [10-15]. We can see the stages of game development as shown in Fig. 3.

A. Study of Literature

This stage searches and reads previous research literature related to develop the game, such as reading information about the flora and fauna typical of Kalimantan, system development methods, game engines used, and information about game platforms, stages of development and system testing method.

There was many research on the game development especially about the methodology for the game development [15-25]. From various existing research, we study, compare and try to analyze the suitable method to develop the game application for this work. The result from the literature review process, we found important stages to develop a game application and we use 6 general stages of the game development that already explained in the beginning of Section II.

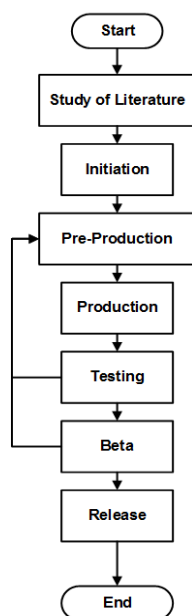


Fig. 3. The Stages of Game Development.

B. Initiation

In this research, a Game with the Platform genre is built where players pass obstacles and defeat existing poachers. The background of this game is to introduce the flora and fauna of Kalimantan Indonesia. The concept of this game is that the player will control a character where to move to the next level the player must find a way and defeat the existing poachers. For age restrictions, this game can be played at all ages. The game will have 6 levels, where there are 2 different levels, namely a special bonus level, and a special level against the last poachers.

This game is built using the Unity game engine with the target device being an Android smartphone device. Some of the features in this game are:

- 1) Single Player Games.
- 2) Game can save player progress
- 3) Game has touch control.
- 4) The game has a gallery feature where there is info on the flora and fauna of Indonesian Borneo.
- 5) Players can adjust the sound volume in the game.

C. Pre-Production

At this stage, the initial game design stage will be carried out, such as creating stories, game rules, determining the software to be used, creating and finding assets, making level designs, game displays, in-game items, and in-game buttons [26-28].

- 1) The draft Story of Game Borneo WildLife is as follows:

The main character is a forest ranger named Agus, ordered by his superior named "Mr. Fery" to solve the problem of existing illegal loggers. Agus was then given 3 main orders by Mr. Fery, namely, destroy the wood machine, destroy the bulldozer, and defeat the leader of the illegal loggers. After that, Agus began to do his first task, namely destroying wood machines, while on his way Agus saw animals such as hornbills and dolphins. Then Agus saw a woodworking machine and smashed it. After destroying the woodworking machine, Agus continued his task of finding bulldozers and destroying them. Then Agus found the Bulldozer engine and then destroyed it. In the end, Agus' task reached the last one, which was to defeat the leader of the loggers, then Agus met the leader of the illegal loggers named Jono, and Agus defeated him. Finally, the forest was spared from the threat of illegal loggers and finished.

- 2) Game rules:

- a) If the player's HP runs out then the game ends.
- b) If the player falls into the water (not included in the bonus level) then the game is over.
- c) The player can go to the next level when the player defeats the boss or reaches the level finish point.
- d) Players will get 1 medkit to replenish HP when players collect 10 coins.

3) Software to be used:

- a) The Game Engine to be used is Unity 2020.01.b8.
- b) Software that will be used as asset creation is Aseprite and PS.

4) Image assets:

a) TileSet

This asset is an asset that will be used for making levels in this game shown in Fig. 4.



Fig. 4. TileSet.

b) Control User Interface (UI)

This asset is the asset that will be used for the creation of the player UI control buttons shown in Fig. 5.



Fig. 5. UI Control.

c) Status UI

This asset is an asset that will be used for making UI status of players and enemies in this game such as UI health of players and bosses shown in Fig. 6 and shown in Fig. 7.



Fig. 6. Icon Medkit, Health Effects and Player HealthBar.



Fig. 7. Boss HealthBar.

d) Menu UI

This asset is an asset that will be used for the creation of the main menu UI in this game shown in Fig. 8.



Fig. 8. UI Menu.

e) Gallery Icon UI

This asset is an asset that will be used for making the Gallery Menu in this game shown in Fig. 9.



Fig. 9. Icon Gallery Item.

f) Title UI

This asset is an asset that will be used for making the title and menu background in this game. The image of the dolphin used for the gallery description shown in Fig. 10 and shown in Fig. 11.



Fig. 10. Background Menu.



Fig. 11. Game Icon and Game Logo.

g) Animation Spritesheet

This asset is an asset that will be used to create animated characters, enemies, and entities in this game shown in Fig. 12 to 19.



Fig. 12. Player Spritesheet Animation.

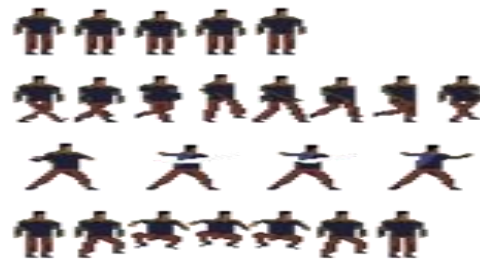


Fig. 13. Enemy Spritesheet Animation.

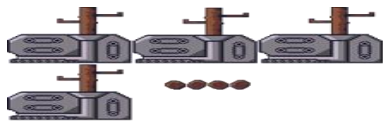


Fig. 14. Lumbermachine Spritesheet Animation.



Fig. 15. Bulldozer Spritesheet Animation.



Fig. 16. Proboscis Monkey Spritesheet Animation.



Fig. 17. Pesut Spritesheet Animation.



Fig. 18. Spritesheet Animation.



Fig. 19. Coin Spritesheet Animation.

5) Audio assets are obtained from:

- a) Mixkit <https://mixkit.co/free-sound-effects/>
- b) RPG music pack <https://svl.itch.io/rpg-music-pack-svl>

6) *Display game design:* The main menu will display several options such as play to play the game from the beginning shown in Fig. 20, continue to continue the progress of the game, gallery to display the gallery menu shown in Fig. 21, settings to display the configuration menu, and exit to close the game application.



Fig. 20. Main Menu.

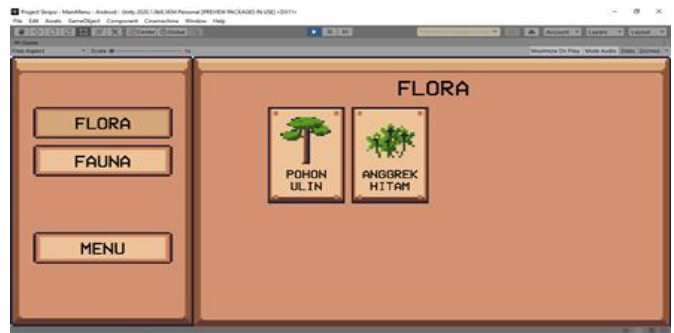


Fig. 21. Gallery Menu.



Fig. 22. Gallery Description.

In the gallery menu, players can see information on the flora and fauna in this game, such as descriptions and original pictures of the flora and fauna shown in Fig. 22.

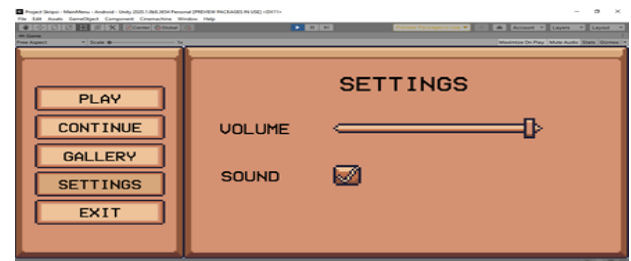


Fig. 23. Settings Menu.

In the settings menu, players can adjust the volume and sound in the game shown in Fig. 23.

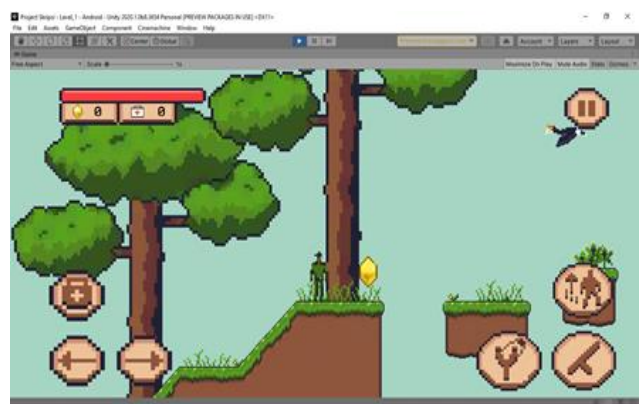


Fig. 24. The Gameplay Menu.

The gameplay view of the game shown in Fig. 24 includes several UIs such as player HP information, coins and medkits, and several UI control Mobile players such as left and right motion buttons, jump buttons, slingshot buttons, medkit buttons, pause buttons, and stick buttons to hit shown in Fig. 25.



Fig. 25. Pause Menu Display.

Pause display when the player presses the pause button.



Fig. 26. Gameover Menu.

Gameover display when the player's HP hits 0 or when the player falls into the water shown in Fig. 26.

7) Items inside the game shown in Table I.

TABLE I. ITEMS IN THE GAME

Name	Symbol	Function
Coin		If the player collects 10 coins, then the player will be given 1 medkit.
Medkit		Medkits can be used to restore blood to the player character.
Movement		To move the character right or left
Pause		To pause the game
Attack		Command the character to attack using the stick
Jump		Character command to jump
Ranged Attack		Command the character to attack using the catapult
Attack		Command the character to attack using the stick

D. Production

At this stage, the author begins to build a game system, such as creating a game plot, creating level designs, and creating a gameplay system shown in Fig. 27.

1) *Game system flowchart*: The game will display the main menu when it is first opened, there are several options on the menu such as play to start the game from the beginning, continue to continue the game based on player save data, gallery to display information on flora and fauna in the game, settings to display the settings menu games such as game volume settings, and exit to close game applications shown in Fig. 28.

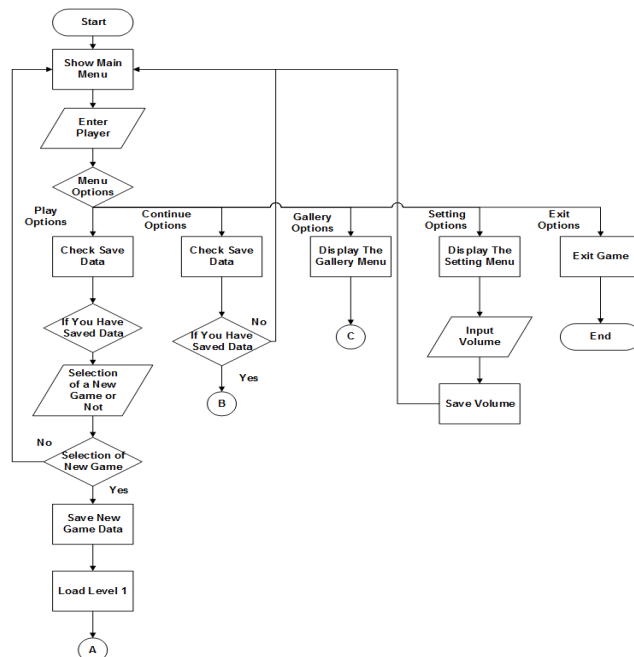


Fig. 27. Flowchart of the Game Menu.

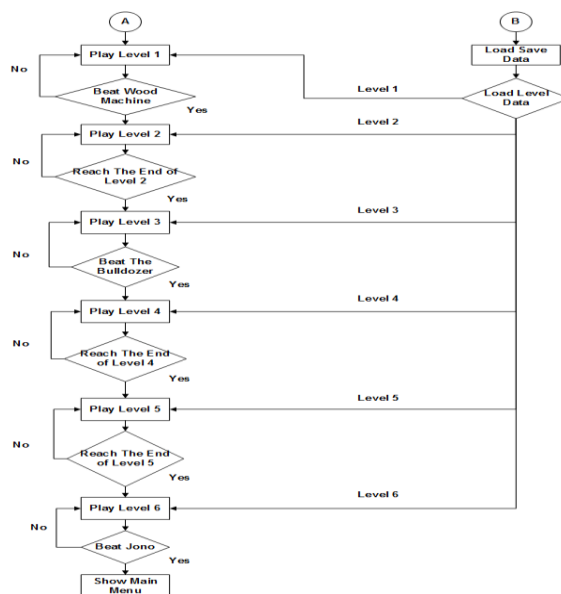


Fig. 28. Flowchart of Gameplay Flow when Conditions Win

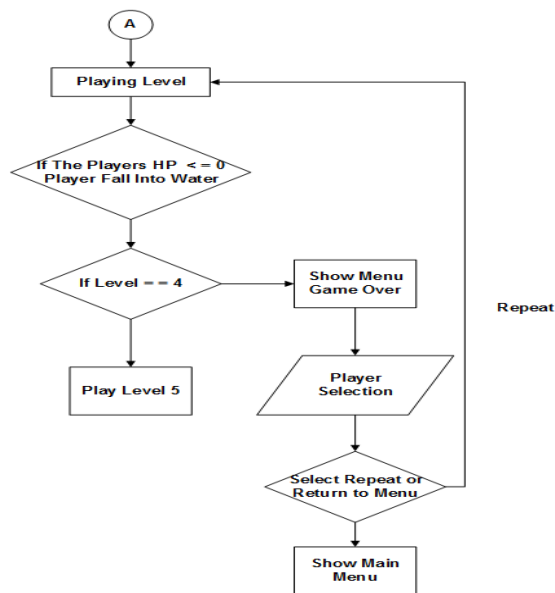


Fig. 29. Flowchart of Gameplay when Losing Conditions.

When loading a level, the game will check the existing save data and load the level based on the existing save data, players can complete the level by defeating the boss or reaching the end point of the level. By the time the player has completed level 6 then the game will be over and over shown in Fig. 29.

When the player's HP reaches 0 or falls into the water, the game will display a game over display with two options, namely to repeat or return to the initial menu, except for level 4 conditions where if the player falls into the water or HP reaches 0 then the player can continue to level next shown in Fig. 30.

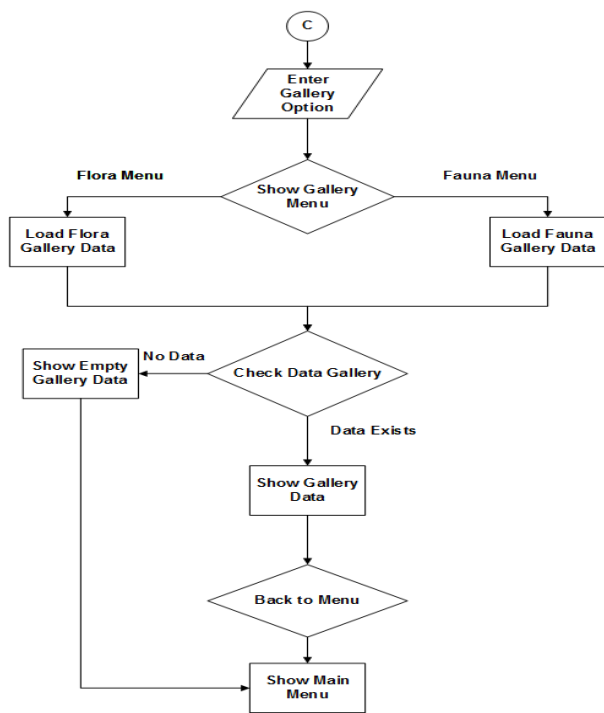


Fig. 30. Flowchart Gallery Menu.

E. The Testing Stage

At this stage a trial is carried out from internal users who will test the game using the provided instruments, assessing the game's function and game balance. The results of these trials are bug reporting, change requests, and video game development decisions. The details explanation about the testing process will explain on the part IV Application Testing.

F. Beta Stage

The beta stage requires external testers as game users and assesses the success rate of games that have been built before being released to the public. They tested whether changes to the features or gameplay were needed, whether there were still weaknesses in each level of the game. If there are still weaknesses, the GDLC cycle can be repeated. The details explanation about the Beta version will explain on the part IV Application Testing.

G. Release Stage

This stage is the completion of the video game that has been built and is ready to be released. The details explanation about the release version will explain on the part IV Application Testing.

III. RESULT AND DISCUSSION

When opening the gallery menu, the game will load the flora and fauna gallery save data that has been opened by the player's progress and display it.

1) *Design level:* Design Level 1 shown in Fig. 31 which is the first level, at this level there are new flora, namely ironwood trees and black orchids, there is a new fauna namely hornbills, at this level there are also 32 coins, 1 moving platform, 7 enemies, 1 boss which is a machine wood, and 5 dialogues which include 1 dialogue at the beginning of the conversation game between Agus and Pak Fery, 1 dialogue when seeing a hornbill for the first time and 3 dialogues for how to play this game.

Level 2 designs, at this level there are 39 coins, 4 moving platforms, 11 enemies, and 2 dialogues including 1 level 2 opening dialogue and 1 dialogue when level 2 is finished.

Level 3 design, at this level there is a new fauna, namely the Mahakam dolphin, at this level there are also 28 coins, 8 moving platforms, 12 enemies, 6 entities of which there are 4 dolphins and 2 hornbills, 1 boss, namely a bulldozer, and 2 dialogues including 1 dialogue when you see the Mahakam dolphin, and 1 dialogue when you meet the bulldozer boss.

Level 4 designs, this level is a bonus level where there are only 24 coins and 28 platforms that can fall. At this level there are no conditions that make the game over.



Fig. 31. Design Level 1.

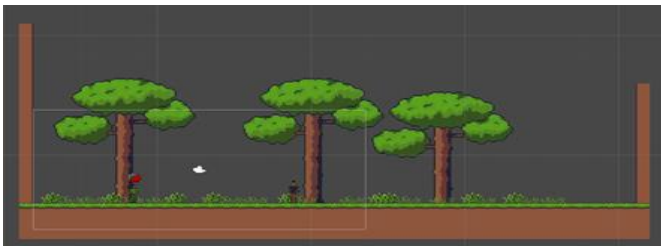


Fig. 32. Design View Level 6.

Design Level 5, at this level there is a new fauna namely Proboscis monkeys, at this level there are also 27 coins, 36 enemies, 6 entities namely proboscis monkeys, and 3 dialogues including 1 dialogue when entering this level, 1 dialogue when viewing proboscis monkeys and 1 dialogue when this level is finished.

Design Level 6 shown in Fig. 32, which is the last level in this game, this level is specifically only against the last boss, namely Jono, the leader of the illegal loggers. At this level there are also 2 dialogues, namely when entering this level and at the time after defeating Jono.

2) *Game system creation*: The basic character behavior that can be done by players, namely hitting, jumping, using a slingshot, moving right and left, using a slingshot, reducing blood, saving character data is made in 3 scripts, namely Player Behaviour, Player Projectile Behaviour, and Player Scriptable shown in Fig. 33 and Fig. 34.



Fig. 33. Player Movement.



Fig. 34. Player Jump.



Fig. 35. Dialog System.



Fig. 36. Behavior of the Enemy Hitting.

In this game the story will be used in the dialog system shown in Fig. 35, while the dialogue system in this game has several parts, namely the speaker avatar, dialogue text, speaker name, dialogue control and dialogue trigger. This dialogue system is made using 3 scripts, namely Scriptable Dialog, Dialog Manager, and Trigger Dialog.

This game has enemies that can attack the player and can walk up to the player, for an enemy system like this is made using 4 scripts, namely EnemyAttribute, EnemyBehaviour, EnemyMovement_1, PreventObjectOnPosition shown in Fig. 36.

The bosses in this game have their own uniqueness and behavior, where bosses such as wood machines cannot move but can remove wood, bulldozer bosses that can move quickly to the right and left, and the last boss Jono who can call for reinforcements. For making the boss, it is necessary to use enemy scripts and 5 additional scripts, namely 2 scripts for the wood machine boss, 2 scripts for the bulldozer boss, and 1 script for the last boss Jono shown in Fig. 37 and Fig. 38.



Fig. 37. Wood Machine Boss.



Fig. 38. Bulldozer Boss.



Fig. 39. Platform System.



Fig. 40. Dolphin.

The platform system shown in Fig. 39, can move as a player challenge which is made using 2 scripts, namely FallPlatform, and PlatformScript. For the next level system, game over, pause, save data, audio sound effect settings, gallery and UI related, 11 scripts are needed, namely, 3 scripts for UI which include GalleryMenu, HealthUiScript, UIControl, and 8 scripts for game manager including AddToGallery, AudioAmbienceSettings, AudioSettingsUI, GalleryScriptable, GameManager, SaveManager, SceneManagement, and SoundManager.

For AI entities, hornbills and dolphins need 2 scripts, respectively, namely hornbill behavior and dolphin behavior shown in Fig. 40.

IV. APPLICATION TESTING

A. Blackbox Testing

The game will be tested by the developer using the Blackbox testing method to see if the various scenarios and functions in the game are running properly. Testing is carried out using the blackbox testing method that focuses on the user's perspective and divided into testing Blackbox UI main menu (Table II), testing Blackbox UI gameplay (Table III), testing Blackbox gameplay scenario (Table IV), and testing for the device (Table V) [26-30].

TABLE II. TESTING BLACKBOX UI MAIN MENU

Scenarios	Success Indicator	Status
Play button on menu (When no save data)	level 1	Success
Play button on menu (When have save data)	Displays the display to create a new save data or not	Success
Continue button on menu (When having save data)	Loading game level according to save data Success	Success
Continue button on menu (When having save data)	level 1	Success
Gallery button on the menu	Displays a display to view fauna and flora gallery data from save data	Success
The flora button in the gallery	Displays a list of flora gallery items	Success
Fauna button in gallery	Displays a list of fauna gallery items	Success
Items in the gallery	Displays a description of the clicked gallery item	Success
Settings button on the menu	Displays the settings	Success
Volume slider in settings menu	Change game sound volume	Success
Toggle enable sound in settings menu	Turn game sound on or off	Success
Exit button on the menu	Exit the game application	Success

TABLE III. TESTING BLACKBOX UI GAMEPLAY

Scenarios	Success Indicator	Status
Move button to the right	Character goes to the right	Success
Move button to the left	Character goes to the left	Success
Jump button	Character jump	Success
Stick button	Character hit	Success
Slingshot button	Character attacks with slingshot	Success
medkit button (when having a medkit)	Replenish the character's HP	Success
Pause button	Pauses game	Success
Continue button on pause	Continue and stop pause in game	Success
Menu button on pause	Return to main menu	Success
Retry button on game over	Repeating the game at that level	Success
Menu button on game over	Return to main menu	Success

TABLE IV. TESTING BLACKBOX GAMEPLAY SCENARIOS

Scenarios	Success Indicator	Status
Fall into the water (except level 4)	Display game over	Success
Player's HP 0	Displays game over	Success
The player hits the enemy or the enemy's catapult.	The enemy takes damage	Success
Enemy hits player	Player takes damage	Success
Players take coins	Player coins increase	Success
Players take coins to 10	Players get medkits and coins return to 0	Success
Level completed	Checkpoint move to next level and save data	Success
Game over (level 6 completed)	Checkpoint move to level 1 and save data	Success
Player reaches the end of the level (level 2 and 5)	Displays the completed level display	Success
The player defeats the existing boss (level 1, level 3, and level 6)	Displays the completed level	Success
Dialog display appears	Character stops	Success
Screen is touched when dialog appears	Displays next dialog	Success
Touch screen when dialog ends	UI will disappear	Success

TABLE V. TESTING THE DEVICES USED BY THE GAME

Device	Specification	Status
Xiaomi redmi note 7	Android 10, Ram 4GB, Resolusi 1080x2340	Runs smoothly
Advan i5c plus	Android 7.0, Ram 2GB, Resolusi 1280x720	Runs smoothly
Nokia 5	Android 7.1, Ram 3GB, Resolusi 1280x720	Runs smoothly

B. BetaTesting

The game will be shared to itch.io using a link and with open beta conditions so that the beta version can be played and tested directly by players, in order to get input or bug reports that the developer did not find. The beta lasts for 2 months from March 11th, 2021 to May 20th, 2021. The target game tester is university friends or gamers from outside to get better

input. The minimum number of players is 10. The players will fill out a form, which contains suggestions and input that has been provided in the game description, through the 8 question tables that have been provided. Here are the results of the beta input from some players:

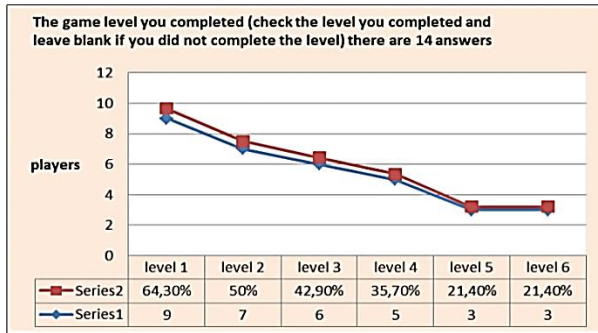


Fig. 41. The Results of the Level Input that have been Completed by the Tester.

Based on Fig. 41, it can be concluded that there are 5 testers who cannot even pass the first level and there are 3 testers who can finish this game.

TABLE VI. UI EXPERIENCE TESTER INPUT RESULTS

UI Experience	Number of Respondents
Great	8 people
Average	6 people
Bad	0
Terrible	0

Based on Fig. 41 and Table VI, it can be concluded that more than 50% of the testers were very satisfied with the UI display in the game.

TABLE VII. RESULTS OF INPUT CONTROL AND UI TESTER

No.	Feedback control and UI Tester
1.	Great, easy to understand, the function of each icon is clear.
2.	For people who have never played the game, it's fun and easy to use
3.	Sometimes it's a bit hard to control the character, UI is standard like other game
4.	Good
5.	Average, not good not so bad
6.	It's good because it works as it should
7.	There is a lack of control, namely when jumping, you can't shoot with a slingshot at the same time. It has a retro atmosphere. And the lack of in-game map instructions is still not available.
8.	the control feels great and the UI fits perfectly for mobile devices
9.	Safe and comfortable, fits well on the thumb.
10.	Reasonable
11.	The UI appearance is good, for control there are still touches that need to be improved again.
12.	Already good
13.	I like the UI design, it looks fresh and the colors chosen are good and match the theme (especially the trees and proboscis monkeys), but for some dialogs there are typos! The controls were a little less smooth as expected and therefore it was a bit difficult for me to complete the levels (especially at level 3, when I first encountered the Mahakam dolphin) and hopefully in the future I can punch or shoot enemies while walking! Because it's so hard to have to stop walking before you can hit! But overall it's a great UI and I love it! (P.S. hopefully in the future I can see my favorite animal (aka Crocodile) on there)
14.	UI controls can be replaced with analog or can choose between analog and buttons

Based on Table VII, it can be concluded that the tester likes the existing controls and UI and can be developed even better.

TABLE VIII. INPUT RESULTS ABOUT ENEMY AI BY TESTER

Enemy AI Experience	Number of Respondents
Great	8 people
Average	6 people
Bad	0
Terrible	0

Based on Table VIII, it can be concluded that the tester is quite satisfied with the existing enemy AI

TABLE IX. RESULTS OF INPUT CONTROL AND UI TESTER

No.	Feedback enemy AI Tester
1.	The enemy continues to follow the player even if he is not looking at the player (on the platform above or below the player)
2.	Pretty fun
3.	As expected, not too hard and not too easy
4.	Good
5.	Need more alive
6.	Here we cannot walk through the water but must be jumped and the enemy can be Diageo and stop when the enemy is too far from us
7.	The enemy is quite aggressive, the damage is also very strong.
8.	The AI for the enemy is great! but the difficulty for the bosses is too hard for the people who play it at first
9.	safe
10.	Can you give some coin after we killed the enemy?
11.	For the AI aspect, it's pretty good
12.	Already good
13.	I think the enemy is not bad (not easy and not too difficult), but for the boss level, it's really difficult and I think there's a bug when we accidentally jump over and get stuck with the boss, we can't help but quit the game and start over.
14.	But overall I enjoy preventing the enemy from destroying the forest to save our Kalimantan!
15.	Ordinary

Based on Table IX above, it can be concluded that the tester has various inputs about the AI in this game and the playing experience is quite different.

TABLE X. GALLERY MENU INPUT RESULTS BY TESTER

Knowing There's Gallery Menu	Number of Respondents
Yes	12 people
No	2 people

TABLE XI. GALLERY MENU INPUT RESULTS BY TESTER

No.	Gallery Information Tester Feedback
1.	Information for flora and fauna is quite complete and interesting.
2.	Very helpful
3.	Quite informative
4.	Good
5.	The gallery menu is quite interesting because we can see a pixelate version of the flora and fauna in Kalimantan and not only that, when the flora and fauna image is clicked it will display more info about the flora and fauna.
6.	it is informative, it has great description and picture to describe the flora and fauna in Kalimantan
7.	the information is complete enough
8.	In my opinion it is very informative but the number of flora and fauna is still small but it doesn't matter.
9.	I like it the design is great and hopefully in the future add more flora and fauna!
10.	The information provided is quite informative and accurate.

Based on Table X above, it can be concluded that more than 80% of testers know that this game has a gallery function to introduce flora and fauna on the Borneo Island.

Based on Table XI above, it can be concluded that the testers already liked the information about flora and fauna displayed on the gallery menu in the game.

TABLE XII. RESULTS OF INPUT, SUGGESTIONS, BUG REPORTS

No.	Tester suggestion, feedback, and bug report
1.	Sometimes when I'm on top of the enemy, the right and left directional buttons don't work, so I have to reset the level.
2.	Need a final look where animals are not scared, get stuck again while finishing the game
3.	Maybe a more minimized dialogue
4.	Sometimes I got stuck when jumping on enemy Other than that maybe you can add achievement system or time attack stage, and English version? Nice game
5.	Very good improve
6.	Bug when player jump above the enemy,
7.	I need a skip tutorial button
8.	A checkpoint needs to be made, so it's not too far to repeat it. Same controls shooting catapults while jumping are made.
9.	It is great! Only minor bug! other than that maybe the font in game seemed too "office" style, try to use more pixelated font for dialog.
10.	When stepping on the enemy (which is normal), there it stuck.
11.	Upgrade control. Get more coins by killing the enemies. Change agus's shirt colour. Tap twice for higher jumping. More damage weapon.
12.	Controls & bugs overhead
13.	I found a bug where people can get stuck and can be crushed if hit by wood that rotates up and down.
14.	add crocodile, thanks
15.	Bug: there is a bug when jumping and landing on the enemy's head Suggestion: -Information in the gallery can be added with information about why the animal/fauna is threatened with extinction, or the bad impact caused if the animal/fauna is threatened or extinct. -Level 4 gameplay is too repetitive, too many NPC Enemy which makes insufficient blood supply. -variation of animals/fauna can be added again

Based on Table XII above, it can be concluded that most of the testers had problems when players were at the head of the enemy causing bugs, this can be fixed in the next iteration of the GDLC cycle before it is released.

C. Gameplay System Revision

Based on the bug report given by the tester, it was more inclined towards a problem where when the player was above the enemy's head causing a problem, then a fix was made for this problem in the game system changes and there was an iteration of the GDLC method, the developer then fixed this problem by making the player move. Penetrate past the enemy so that the previous problem will not occur again with duration of 5 days from May 20th, 2021 to May 24th, 2021.

D. Release

After going through the cycle of making, repairing, and following input from several testers. Finally, the game enters the final stage, which is a release that is ready to be released on Itch.io by changing its status from in development to release on May 24th, 2021; the download link for this game will be shared to several social media such as Facebook and Instagram. The game received 46 downloads from March 1st, 2021 to May 24th, 2021 shown in Fig. 42.

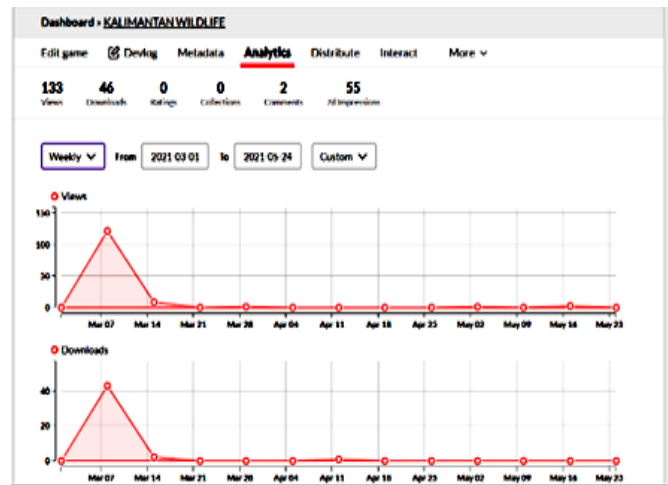


Fig. 42. Borneo Wildlife Download Statistics.

The rating of this game refers to the ESRB at the following link <https://www.esrb.org/ratings-guide/>, namely with a rating of all ages, because it does not contain abusive language and violence.



Fig. 43. Rating Images for All Ages.

V. CONCLUSION

Based on the results of research that has been carried out in the design and development of the game "Kalimantan Wild Life", the author draws several conclusions, namely the research produces a game platform "Borneo Wildlife" with the theme of flora and fauna on Borneo Island, Indonesia, the design and manufacture of the game "Borneo wildlife" has passed the stages of the GDLC method with the longest phase being the Beta test for 2 months, and the shortest phase being the release for 1 day. In the development of the game "Borneo Wildlife" a revision was made to provide a better playing experience from the considerations and inputs of the existing testers. The future work from this study is to analyze the impact of this educational game because of the main expectation of this game is to introduce the flora and fauna in the Borneo island to the world and give positive impact to the young generation.

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