

DEVELOPMENT OF GAME PARAGLIDING SIMULATION

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ABSTRACT

Paragliding is one of the free flying sports, from distributing questionnaires that are carried out by the large interest of people who do not know the technique and weather factors that must be considered in paragliding is quite large, and paragliding can not be done at any time because of certain weather conditions. With the things mentioned above, then to be able to learn paragliding technique that are interesting, multimedia is the use of computers that allow users to navigate, interact with the system. Games can be an exciting learning tool and are believed to be more effective because players consciously or not have experienced a phase of learning that is inserted into the flow of the game. With the limited time that paragliding can not be done at any time, the solution that will be used to solve this problem is to use simulators in the context of simulation games because simulation-based games are designed to simulate existing problems, so that the acquired nature or lessons are used. resolve the problem. Based on the results of the tests performed, a percentage of 86% found that the game paragliding simulation can introduce movement and weather factors to paragliding air sports activities and can be a virtual means to try paragliding sports that are carried out anytime with scenarios of changing weather conditions.

Keywords : Game, Game Simulation, Game Paragliding Simulation, Paragliding, Multimedia Development Life Cycle, Metode luther.

1. INTRODUCTION

paragliding is a sport that is one of free flying sports. Paragliding can be called a parachute that is flown by a pilot with the help of wind on a hill or mountain area, this Parachute takes off and lands using the pilot's feet [1]. Paragliding sports take off from a hillside or mountain by utilizing air, wind and weather. Activists who focus on this sport have the potential to become athletes, the profession of pilots in the aerotourism area, or also activists can consider this sport as a hobby.

Paragliding sports using air, wind and weather so paragliding cannot be done at any time, to be able to do paragliding must see the three factors fulfilled then paragliding can be done, even places where paragliding in Indonesia each has a flying season due

to influence weather factors in that place. Seeing the response from the public to paragliding sport through questionnaires, respondents stated that they did not know the technique and weather factors that must be considered in paragliding but the size of the community's interest in learning paragliding was quite large.

To be able to learn the movements or techniques of interesting paragliding, Multimedia is the use of computers that make and combine text, graphics, audio video, and animation that allows users to navigate freely, interact, create and communicate [2]. Games can be an exciting learning tool and are believed to be more effective because players consciously or not have experienced a phase of learning that is inserted into the flow of the game [3]. With the limited time that paragliding cannot be done at any time, the solution that will be used to solve this problem is to use a simulator in the context of a simulation game. Simulation-based games are built and designed to simulate real events that exist, so that the main things or lessons that can be used by players to solve the simulated problems are obtained. Simulation games with the aim of education are also said to have a learning pattern with simulation, because players are required or required to learn so they can solve the problems presented in the game [4].

Based on the results of a questionnaire submitted to the public online which spread through social media and filled by 80 respondents, it was found that 80.3 percent stated that paragliding was a very attractive branch of aerial sports, as many as 84.8 percent of respondents said they did not know the movements in paragliding and 84 percent said they did not know what factors were influential and must be considered before doing paragliding. and the community also replied that 71.5 percent were interested in learning paragliding air sports.

To answer the problems that have been raised, a media that can provide information or education is needed that has a learning pattern of 'learning through simulation' for prospective paragliding activists. then the author is interested in conducting a research entitled "DEVELOPMENT OF GAME PARAGLIDING SIMULATION".

1.1 Goal and Purpose

The purpose of this final assignment is to design and build Paragliding Simulation Games in hopes of helping to introduce and educate people who are interested in learning paragliding about techniques and things that are considered when going to paragliding.

The objectives to be achieved from this final assignment are :

- a. Recognition of movements or techniques and weather factors for paragliding by using patterns of delivery with simulation.
- b. People can try virtual paragliding which can be done at any time with different scenario situations when played.

2. CONTENT OF RESEARCH

2.1 Theoretical Basic

The theoretical foundation used in this study is as follows.

2.1.1 Paragliding

Paragliding is one of the branches of free flying from the air. Paragliding can also be interpreted as a parachute that is flown or can lift a body of a pilot. This parachute takes off or takes off and lands or lands using the pilot's feet. Paragliding sport takes off from the slopes of a high hill or mountain by utilizing the power of the wind as its main force [1].

2.1.2 Multimedia

In general, multimedia is closely related to the use of more than one type of media used to present information to users, such as text and sound. In particular, the multimedia that is on the computer is no longer a new thing, because the relationship between text and images is a major component in many application software that has long been done [6].

Multimedia is also divided into two categories, namely [7] :

1. Linear multimedia is multimedia that cannot be operated or no control is provided to be operated by the user.
2. Interactive Multimedia is multimedia that can be controlled or operated by users, users are free to make choices and what is desired for the next process.

2.1.3 Game

Games come from foreign languages, English which means games. One function of a game is to be able to relieve stress and boredom. Aside from being a stress reliever the game can also be used as a means of education, therefore many people are happy when playing games both small children, teenagers and adults, which distinguishes teenagers and young

children from the types of game genres and gameplay that they play.

Like everything else, the game must also have a positive impact and a negative impact on its users. Examples of positive impacts, for example: the game can relieve stress, then another positive impact for children is as a medium that can increase brain responsiveness, speed of decision making, etc., and many other positive impacts. Examples of negative impacts, for example: forgetting time, and damaging the eyes if playing too long [8].

2.1.4 Android

Android OS is one of the operating systems designed for mobile, open source Android based Linux which includes the operating system itself, middleware and android applications. Android is also an open source operating system or operating system that is open for developers to create their applications [9].

2.2 Research Methodology

The research methodology used in this research writing consists of several stages.

2.2.1 Data Collection

Data collection methods used in writing and building software can be seen in the description below :

- a. Study of literature
This literature study is done by searching for reading a book, journal, article on the internet, and other scientific works to get the necessary images and theories related to this research.
- b. Questionnaire
The questionnaire is a method of data collection that is done by giving a number of questions to the respondent who must then be answered.
- c. Interview
The interview is a method of data collection conducted by asking a number of questions to certain speakers related to this research.

2.2.2 Data Analysis

Data analysis of data analysis in writing this research is done to find out what data is needed for later soft devices.

2.2.3 Methods of Software Development

The Software Development Method used in this study is MDLC. Multimedia Development Life Cycle was stated by Arch Luther, who stated that the development of multimedia software was carried out based on six stages, namely the concept, design, material collection, manufacture or construction of software, testing and distribution of software [5].

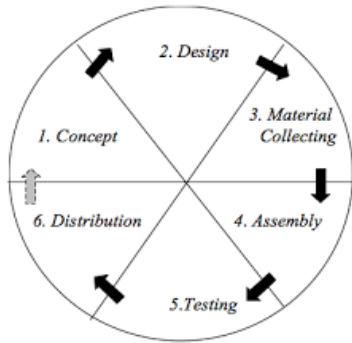


Figure 1 MDLC Method - By Luther

2.3 System Analysis

System analysis is defined as the decomposition of an intact system that will be built into the component parts inside of it by aiming to identify and evaluate the problems and obstacles that occur and the needs that are expected.

2.3.1 Analysis of Problems

In this study the authors get several problems that occur so that the construction of this system is as follows :

- Paragliding sports using the air, wind and weather are suitable for paragliding, this causes paragliding to be carried out at any time.
- The amount of public interest in paragliding and are interested in learning paragliding, but do not know the movements or technique and influence of the weather on paragliding activities, so that virtual media is needed to do paragliding with different weather conditions.

2.3.2 Analysis of system architecture

System architecture analysis is a system design from the game "Paragliding Simulation".

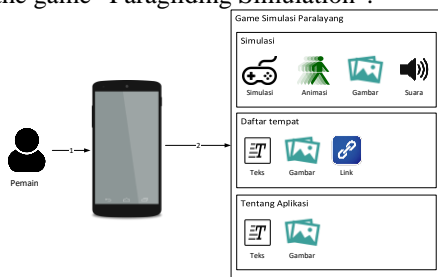


Figure 2 Game Paragliding Simulation System Architecture

The following is an explanation of the game system architecture "Paragliding Simulation" as.

- The user accesses the Android Smartphone that is owned by the user.
- Smartphones access applications that have been installed on the player's Smartphone. In the installed application there will be 3 features available, namely Simulation, List of Paragliding Places, and about the application. The Simulation feature is the main feature for

conducting paragliding sports simulations, the List feature is an additional feature that contains a list of paragliding places in Indonesia, and features about the application containing information about the application.

2.3.3 Material Analysis

The material presented in the application that will be built includes 2 materials, namely movements and influential factors.

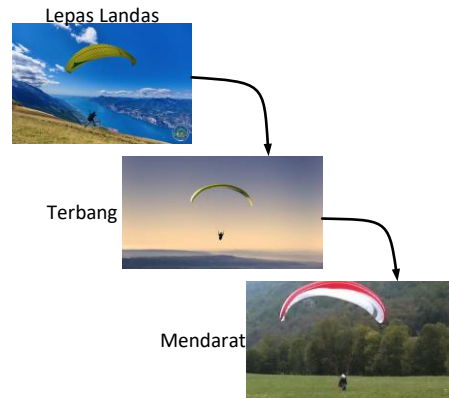


Figure 3 Flow of Movement or Paragliding Technique

The basic movement of paragliding is divided into several stages, namely takeoff, fly and then land. While the influential weather factors are wind speed and air pressure.

2.3.4 Game Genre Analysis

Genre in paragliding simulation games is Real World Simulation (simulation). It is a genre where later players will play a game that seems like the player is doing paragliding.

2.3.5 Game Play

a. Explanation of game play

At this stage there are two choices of levels of difficulty, namely Normal Simulation and Advanced Simulation. Gameplay at each level has an equation, namely tapping on the screen to move the character of the difference is the amount of wind speed and air pressure that the system randomly performs. At first the character is on a hill then the player has to fly with paragliding to the landing area below. The flow in the simulation gameplay is as follows explained in the picture

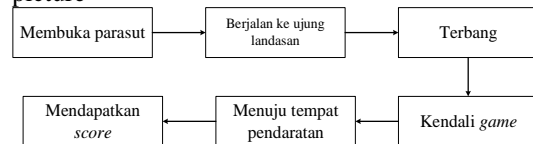


Figure 4 Plot Gameplay Simulation

b. Scoring

Appraisal or scoring carried out by the application refers to the habit in paragliding, that is, every paragliding place has a hill that is used to take off, and

a large area such as a field used for landing. All paragliding athletes or athletes are required to land at the designated location, in the paragliding simulation game there are 5 landing zones and in each zone there are different points.

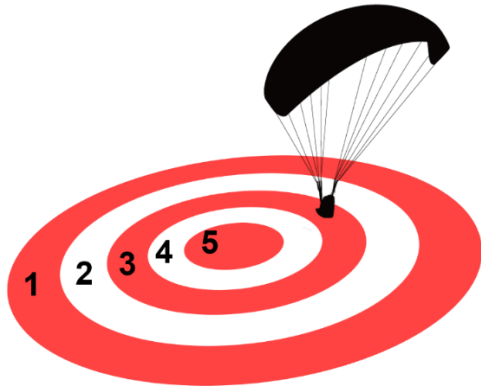


Figure 5 Zone Score illustration or Rating on Game Paragliding Simulation

When a player successfully lands a character in a certain landing zone, it will display a score. Here is a complete description of the score zone can be seen in table 1.

Table 1 Zone and Score

No	Zona	Keterangan
1	Zone 1	Getting score 1
2	Zone 2	Getting score 2
3	Zone 3	Getting score 3
4	Zone 4	Getting score 4
5	Zone 5	Getting high score 5
6	Not in Zone	Not getting score

2.3.6 Functional Requirement Analysis

Analysis of functional requirements is a process of drawing systems, planning systems and making sketches or arrangements of several separate elements into one whole and functioning unit. Tools to describe the system using the Unified Modeling Language (UML).

2.3.7 Use Case Diagram

Use Case Diagram is a model describing what functionality is contained in a system [10].

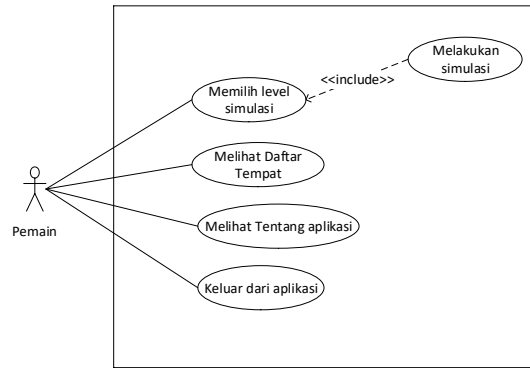


Figure 6 Use Case Diagram Game Paragliding Simulation

2.3.8 Activity Diagram

Activity diagram in the selection of levels contained in this study as follows.

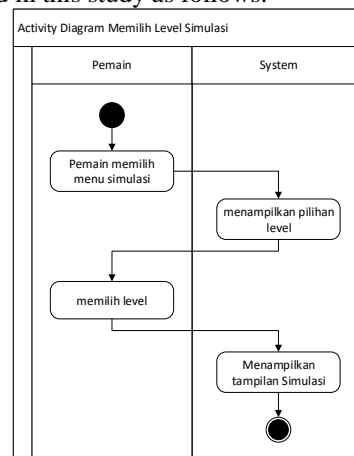


Figure 7 Activity Diagram selects levels in Game Paragliding Simulation

2.3.9 Sequence Diagram

Sequence diagrams in the selection of simulation levels contained in this study are as follows.

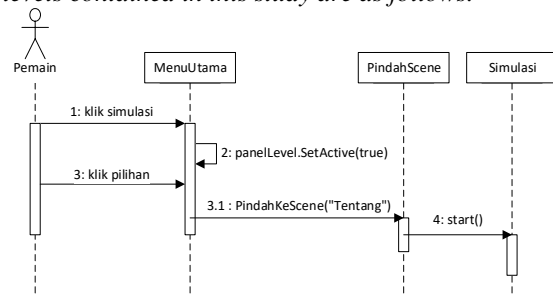


Figure 8 Sequence Diagram Selects Levels in Game Paragliding Simulation

2.3.10 Class Diagram

The example class diagram contained in this study is as follows.

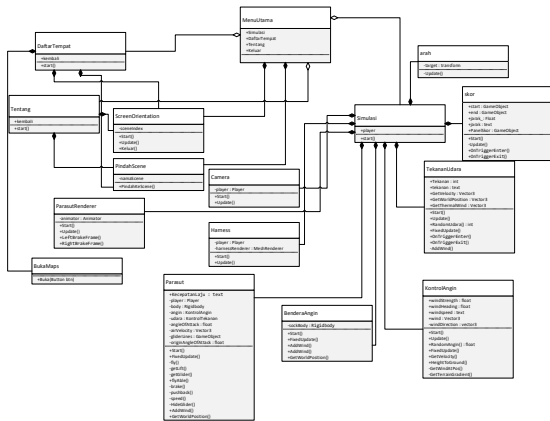


Figure 9 Class Diagram in Game Paragliding Simulation

2.4 Design of The System

System design is the result of an overview of the design and manufacture of software systems to be built. Next is the menu structure of the paragliding simulation game.

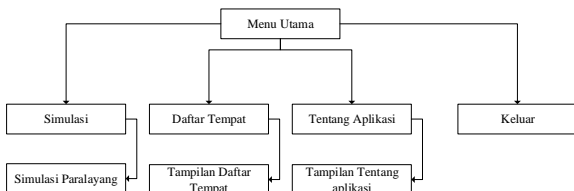


Figure 10 Menu structure in Game Paragliding Simulation

The menu of this paragliding simulation game consists of one main menu, namely Simulation, one additional feature menu that contains a list of places for paragliding on the Place list menu, a menu about applications that contain applications.

2.5 Implementation of Interface

Implementation of the interface is done on applications that have been made that have been previously designed from the design that has been made before.

a. Main Menu Interface Implementation

The main menu interface is an interface that displays any menu features in this paragliding simulation game. The implementation of the interface from the Main Menu is as follows :



Figure 11 Main Menu Interface

b. Simulation Interface Implementation

The simulation interface is the interface that displays the main feature in this paragliding simulation game, paragliding simulation. The interface implementation of paragliding simulation is as follows :

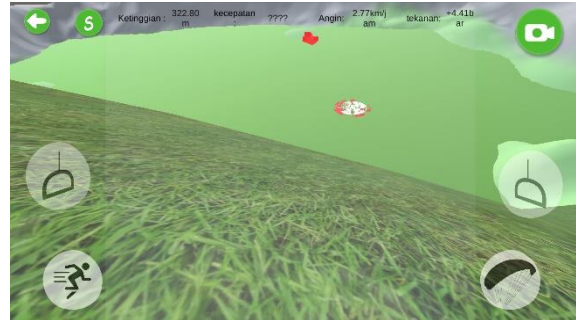


Figure 12 Simulation Interface

c. Implementation of Interface List of Paragliding Places

Interface List of paragliding places is an interface that displays an additional feature that contains places that distinguish paragliding in Indonesia. this paragliding. The implementation of the interface from the list of paragliding places is as follows:



Figure 13 Interface List of paragliding places

d. About Interface Application Implementation

Interface About the application is an interface that displays about this paragliding simulation game. The interface implementation from selecting stages is as follows :



Figure 14 Interface About the application

2.6 Testing System

System testing is done to find out whether the application that has been built can be run. The system testing uses two testing techniques, namely functional testing and beta testing.

2.6.1 Functional Testing

Functional testing is done in order to find out whether the functional that has been designed has been running or not, as for the following are functional testing testing scenarios.

Table 2 Scenario Testing of Parallel Simulation Game Functions

No	Functional	Testing Method
1	Choose level a. Select the simulation button b. Select the Simulasi Normal button c. Select the Simulasi Advanced button	<i>Black-Box</i>
2	Perform a simulation a. Selection of random numbers of wind speed b. Selection of random air pressure numbers c. Open parachute d. Walk forward e. Turn right f. Turn left g. Landed at score zone 1 h. Landed at score zone 2 i. Landed at score zone 3 j. Landed at score zone 4 k. Landed at score zone5 l. Landing not in the zone m. Move the camera n. Change mode camera	<i>Black-Box</i>
3	See List of Places of Paragliding a. Select the Register place button b. Select the back button c. Select the maps button	<i>Black-Box</i>
4	See About the Application a. Select the About Application button b. Select the back button	<i>Black-Box</i>
5	Exit the application a. Select exit button b. Choose tidak c. Chooser ya	<i>Black-Box</i>

A. Case and test results

The case taken as an example is testing the functionality to choose the level in the paragliding simulation game.

Table 3 The test table selects the level in Paragliding Simulation Games

Action	Expected Results	Description
The user selects the simulation button to select the level	Displays a level selection display	[√]Accepted []Not accepted
The user chooses the normal level to do the simulation	Display the simulation display	[√]Accepted [] Not accepted
The user selects the advanced level to do the simulation	Display the simulation display	[√]Accepted [] Not accepted

B. Conclusion Functional testing

Based on the results of functional tests that have been done, it can be concluded that all processes in the Paragliding Simulation Game built on its entire functions have gone as expected.

2.6.2 Beta Testing

Beta testing is done to find out fully whether the software or application that has been built has met the needs of the desired destination or not. Beta testing is done by giving a number of questions related to the purpose of the software that is built on randomly selected users.

The following is an assessment scenario of beta testing which consists of a list of questions to the user number of respondents 15 people and the weight of the questionnaire assessment that has been proposed using a Likert scale measurement.

A. Assessment Scenario with a Likert Scale

To evaluate the answers to the questionnaire using the Likert scale, use the following formula :

Table 4 categories of answer questionnaires

Weight	Description
1	Strongly disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly agree

$$Interval = \frac{A - B}{\text{many classes}}$$

Descriptions :

Interval = Interval value

A = total respondents x highest weight

B = total respondent x lowest weight

The above formula is used to calculate the intervals of each answer obtained from respondents, while for the assessment interval used are as follows:

Table 5 Likert Scale Interval Table

Category	Interval
Strongly disagree	15 – 27
Disagree	27 – 39
Neutral	39 – 51
Agree	51 – 63
Strongly agree	63 – 75

B. Results of First Purpose Assessment

Based on the results of the calculation of the first purpose questionnaire, it was found that the average value of the questionnaire assessment of the first goal was 61.5 and was in the "Agree" category. Taken from each value in each question consisting of 2 closed questions.

C. Results of Assessment of the second objective

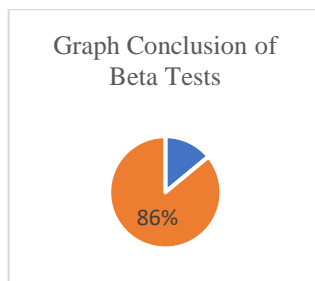
Based on the results of the questionnaire calculation, the second goal was obtained that the average value of the questionnaire assessment of the second goal was 67.5 and was in the category of "Strongly Agree". Taken from each value in each question consisting of 2 closed questions.

D. Conclusion of Beta Testing

The conclusion of beta testing can be seen in the table.

Table 6 Conclusion of Beta Testing

No	Pertanyaan	Nilai	Persentase
1	First question	64	85.33%
2	Second question	59	78.67%
3	Third question	69	92.00%
4	Fourth question	66	88.00%
Total		258	344
Average		64.5	86%



Based on beta test results carried out by distributing questionnaires submitted to 15 respondents obtained for testing the first goal of respondents said that this game can adequately introduce movement and weather factors to paragliding air sports activities by referring to the

results of the average value of intervals on each question with a conclusion "Agree".

And to test the second goal the respondents said that this game can be a virtual tool to try paragliding which is done anytime with a scenario of changing weather conditions with reference to the results of the average interval value on each question with the conclusion "Strongly Agree".

3 COVER

3.1 Conclusion

Based on the results of the analysis, design, implementation and testing phase, conclusions were obtained along with suggestions from the development of Paragliding Simulation Games. The conclusions from the results of this study are as follows :

- Development of Paragliding Simulation Games can introduce movement and weather factors to paragliding air sports activities.
- Paragliding Simulation Games can be a virtual means to try paragliding which is done anytime with a scenario of changing weather conditions.*

3.2 Suggestion

The author realizes that the construction of software built is still far from perfect and has not been optimal in its application. Therefore there are several suggestions that can be taken into consideration in its development. The suggestions are given so that the system becomes better and optimal, which includes :

- Improve graphics quality in this Paragliding Simulation game.
- How to play more interesting, can be optimized again.

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