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To cite this article: N L P Ardani *et al* 2020 *J. Phys.: Conf. Ser.* **1516** 012012

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The development of “I Sangging Lobangkara” balinese folklore as an android based game

N L P Ardani¹, K T Dermawan², I K R Arthana³ and I M Putrama⁴

^{1,2,3,4} Informatics Education Department, Faculty of Engineering and Vocational,
Universitas Pendidikan Ganesha, Indonesia

E-mail: niputuardani@gmail.com¹, teguh.demawan@undiksha.ac.id²,
resika@undiksha.ac.id³, made.putrama@undiksha.ac.id⁴,

Abstract. The main goal of this study was to create an android game that introduces and maintains Balinese Folklore I Sangging Lobangkara. Balinese Folklore I Sangging Lobangkara has a lot of moral value that began to be forgotten. This folklore was about a very famous painter, I Sangging Lobangkara. Hearing the news of I Sangging Lobangkara's skill in drawing, The King invited him to The Palace to test his skill. Those challenges from The King were packed as the challenge of the game. The game of Balinese folklore I Sangging Lobangkara was developed using Android Studio with library libGdx. The testing of the application was done by white box testing, black box testing, content expert testing, media expert testing, and user usability testing. Balinese folklore “I Sangging Lobangkara” game in Android successfully applied in all of the android's features which is tested and there was not any error found.

1. Introduction

Indonesia is a unitary state full of diversity consisting of diverse race, ethnicity, religion, and culture. Culture emerges from a group of people passed from generation to generation. There are seven elements of culture in general proposed by Kluckhohn, namely the language, knowledge systems, social organization, equipment life and technology's system, livelihood's system and arts and religion's system [1][2]. One example of the artistic elements in culture is folklore.

Folklore is traditional stories which are passed down orally from one person to another in a society. Folklore includes all the knowledge, values, attitudes, assumptions, feelings, and beliefs spread in the traditional form through the habits. There are 18 values of character education should be taught to the students and society, namely the religious values of honesty, tolerance, discipline, hard work, creative, independent, democratic, curiosity, the spirit of nationalism, patriotism, respect for the achievements, friends/ communicative, peace, reading habits, caring for the environment, social care, and responsibility [3].

One of the folklores that contains many cultural and moral values began to be forgotten is Sangging Lobangkara or also called ‘I Sangging Nemu Suargan’. I Sangging Lobangkara was a smart young man who was famous for his painting. His ability in painting was heard by the King. Then the king



ordered I Sangging Lobangkara to come to his palace, to test his skills. I Sangging Lobangkara could complete every request from the king which left the king in amazement. As his final request, the king ordered I Sangging Lobangkara to draw the whole celestial objects in space. Determined to fulfill the king's order, I Sangging Lobangkara sat on a *goangan* (in English "Kites") and flew into the sky. Unexpectedly, the rope was broken causing him to be drawn up high till he reached The Heaven. Finally, I Sangging Lobangkara stayed in the heaven [4][5]. The story represents the idea that I Sangging Lobangkara was a hardworking person, he realized that the continuous requests of the King were very demanding but he remained obedient to the king and did it wholeheartedly. His hardworking character is evident from the results of the paintings I Sangging Lobangkara which were very admirable and amazed the King.

Technology and culture actually have an important role in human life. Culture must be conserved by utilizing the technology as one of its ways. Thus, we can use the technology without leaving the culture as the identity of each region. One example of employing technology in preserving the culture is the development of games with the concept that take Balinese folklore I Sangging Lobangkara. This game was developed to introduce the Balinese folklore I Sangging Lobangkara that packed with display and attractive animations.

Video games or games that provide virtual information, have rules and storyline, challenging, interactive and is played by manipulating images on the screen [6]. Games can be played on multiple devices such as consoles, PC (Personal Computer), and mobile. But with the development of technology, the authors noticed that the games which played in mobile device is growing rapidly. Currently, the mobile device which still be chosen by the public is the Android mobile device, because Android mobile device has a variety of price ranging from an affordable price to highly expensive price. Even more, Smartphone Android platform still dominates the worldwide share market with the number average 66-71% in the United States throughout 2016 [7]. This result is undoubtedly coming from the inevitable need for mobile technology in the community.

Based on the explanation above, through a study entitled "Development of the Balinese Folklore Game I Sangging Lobangkara on Android", a game application with the concept of Balinese folklore, I Sangging Lobangkara was developed. The development of this game aimed at introducing and preserving Balinese culture, one of which is Balinese folklore I Sangging Lobangkara, through the excellence of technological development, especially the development of Android cellphone technology. This research was based on the widespread use of mobile devices in the Android community. In addition, the Balinese Folklore Game I Sangging Lobangkara can also be used as a medium for character education given that the story implies moral and cultural values. Development of the Balinese folklore game I Sangging Lobangkara using Android Studio with libGdx library. This development uses the ADDIE Method which stands for Analysis, Design, Develop, Implement, and Evaluate.

Based on the explanation, then developed a game application with the concept of Balinese folklore I Sangging Lobangkara in the form of a study entitled "Development of Game Balinese Folklore I Sangging Lobangkara in Android". The development of this game aims to introduce and conserve the culture of Bali, the Balinese folklore I Sangging Lobangkara with the advantage of technological developments, especially the development of the Android mobile technology. This is based on the widespread use of mobile devices in the Android community. Beside that also the Game Balinese folklore I Sangging Lobangkara can be used as an educational media characters because the story implied moral values and cultural values. The game was developed using Android Studio with library libGdx. The development used ADDIE Method which "ADDIE" stands for Analyze, Design, Develop, Implement, and Evaluate.

2. Definition of Terms

2.1. Android Studio

Android Studio is an IDE (Integrated Development Environment) officially provided free by Google for Android application development, based on IntelliJ IDEA [8].

2.2. Framework LibGdx

LibGDX is an open source, cross-platform development framework, which is designed mainly, but not exclusively, to create games using the Java programming language. [9].

2.3. ADDIE Model

The ADDIE Model is an iterative instructional design process, which is used in designing and developing educational and training programs. “ADDIE” stands for Analyze, Design, Develop, Implement, and Evaluate [10]. During the Analysis Process, the problem was defined, and a task analysis was done. After that, the game design is developed, such as making the scenario of the game, game stage, and character’s design. After the design was completed, in the Develop stage, the the design was implemented to the game. Finally, the game was published and tested to some users from various age.

3. Game Design

This game is divided into 4 stage that has different challenges, such as hitting the enemy, collecting item, time limited, resolving the puzzle, and coloring. Here is the navigation structure that shows up in the scenario of the game.

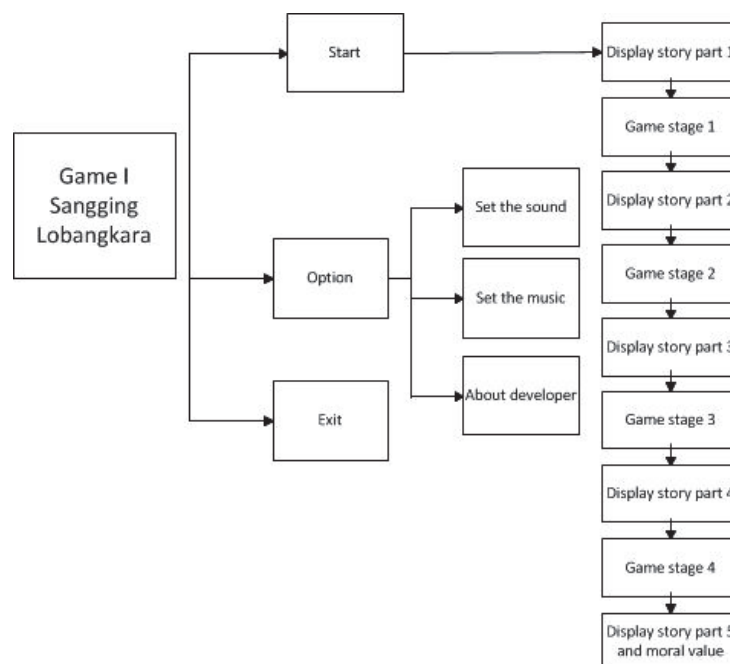
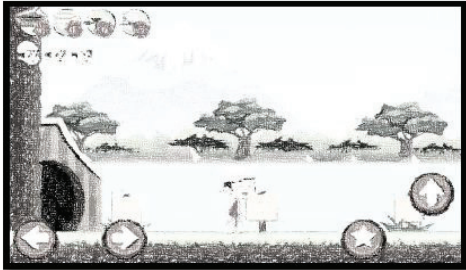
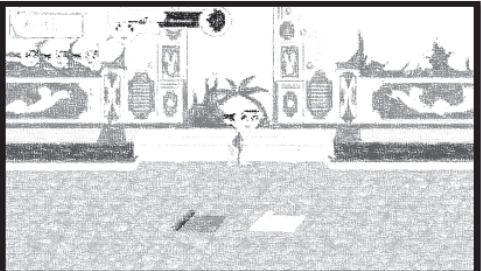
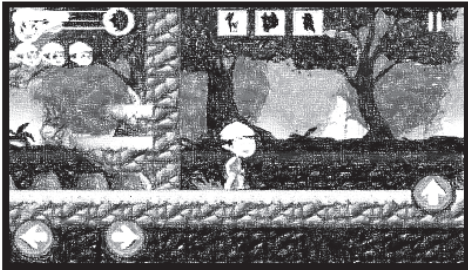


Figure 1. Navigation Structure of Game Cerita Rakyat Bali I Sangging Lobangkara.**Table 1.** The Scenario of The Game.

Design Stage	Explanation
	<p>The story: The king asked I Sangging Lobangkara to build a beautiful palace</p> <p>Game play: User must collect the necessary building material to build a palace, such as sand, stone, water, lotus flowers, and money by hitting the object. User must avoid to hit enemy, such as bird and strawberry man. Once the user hit the enemy, the user will lose.</p> <p>After the user have collected all the building material, user will receive all object that must be arranged, that are house, statue, park, fences and trees. To win stage 1, the user must arrange the objects into a palace. If user win stage 1, story and stage game 2 will be opened</p>
	<p>The story: The king asked I Sangging Lobangkara to paint The Queen</p> <p>Game play: This stage is simpler than stage 1, but this stage has time limitation. Thus, the user must solve the challenge before the time is up. User must collect any paper and pencil by touching the object in the screen. If all the paper and pencil have been collected, the game will display a puzzle screen that contain a picture of the queen. User must arrange the puzzle. After it is done, the user must color it by touch the object in the screen. To win this stage, the color must be identical with the queen that displayed in the screen.</p> <p>If the user win stage 2, story and stage game 3 will be opened.</p>
	<p>The story: The king asked I Sangging Lobangkara to go to the Forest and draw the animals that he meets</p> <p>Game play: The user must find 3 animals in this stage to paint. This is an adventure stage that mixed with puzzle and coloring. The point of this game are pencils, money, and paper. The animals are peacocks, deer, and jalak bali. The enemies are strawberry man, water, and floating land. To win stage 3, the user must find the 3 animals and solve and color the puzzle.</p> <p>If user win stage 3, story and stage game 4 will be opened.</p>


Design Stage	Explanation
	<p>The story: The king asked I Sangging Lobangkara to go to the sea and draw sea animals that he met</p> <p>Game play: The user must find 3 sea animals in this stage to be painted. This is an adventure stage that mixed with puzzle and coloring. The point of this game are pencils, money, and paper. The sea animals are sea horse, whales, and fish Cork. The enemies are purple algae, red algae, and coin-stealing flowers. To win stage 4, the user must meet the 3 sea animals and solve that puzzle and coloring. If user win stage 4, story part 5 will be opened.</p>

Figure 5. Design Stage Game 4.

4. Result

4.1. Software Implementation

a. Splash screen interface

The interface of splash screen is displayed when the application is first opened.



Figure 6. Implementation of Splash Screen's Interface.

b. Home screen interface

Interface of home screen was designed as the main screen of the game.



Figure 7. Implementation of Home Screen's Interface.

c. Interface of Information Game Screen

Interface of information game screen was designed to show the identity of the game.



Figure 8. Implementation of Information Game Screen's Interface.

d. Interface of Beginning Story Screen

Interface of beginning story screen was designed to display the options game's story.



Figure 9. Implementation of Beginning Story Screen's Interface.

e. Interface of Story Screen

Interface of story screen was designed to display the story of I Sangging Lobangkara.



Figure 10. Implementation of Story Screen's Interface.

f. Interface of Game Play

Interface of game play was designed to display the game play of I Sangging Lobangkara.

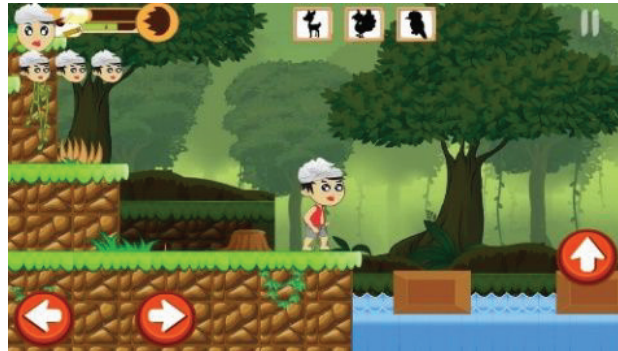


Figure 11. Implementation of Game Play Screen's Interface.

4.2. Testing Software

Here are the procedure of the Balinese folklore I Sangging Lobangkara testing as outlined in Figure 12.

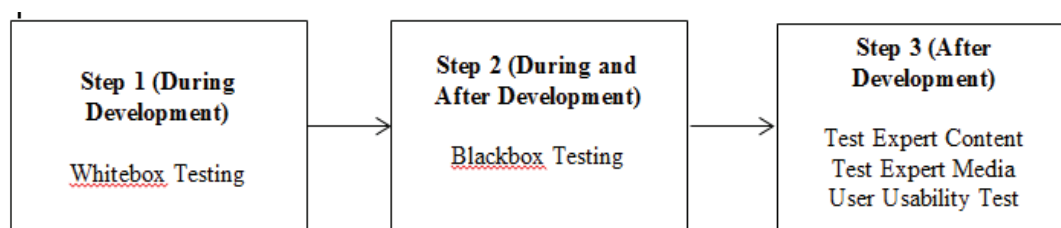


Figure 12. The procedure of the Balinese folklore I Sangging Lobangkara testing.

Step 1

Whitebox Testing: The algorithms tested were algorithms of Asset manager, controlling story, controlling player, controlling enemy, controlling environment the player and game rule. By seeing whitebox test results, it can be stated that all of the algorithms used for the development of Balinese folklore Game I Sangging Lobangkara was correct and the output was in conformity with the purpose of each of these algorithms.

Step 2

a. Functional Tests (Blackbox): This testing is conducted by programmer and user

Test Case 1 (programmer): Test cases 1 aimed to find out the truth of the Game Balinese folklore I Sangging Lobangkara. All processing was done from the game run for the first time until it was finished. The tests were done by the game developers. All the features in the game was running as planned.

Test Case 2 (user): Testing test cases 2 was done by the user. At this stage, two people testing the application were given a questionnaire after using Game Balinese folklore I Sangging Lobangkara on smartphones. The results of the test case 2 was that the game can run properly.

Step 3 (Product Testing)

The instrument used to test the product was a questionnaire. The questionnaire used consisted of five choices, namely Very Good, Good, Fair, Less, and Very Less.

- a. Test Expert Content: Based on the story, the indicators chosen in content expert testing are in terms of the relationship between the storyline and the game, the clarity of the storyline and moral value. The percentage of results test expert Content is 95.71%, which means the results of the test content expert in the range Very Good.
- b. Test Expert Media: The aspects tested in this test were the story game, mechanics, and aesthetics [11]. The percentage of test results Expert Content is 98.46%, which means the results of the test content expert was very good.
- c. User Usability Test: User usability test was conducted to determine the level of satisfaction and general user response to the game I Sangging Lobangkara folklore. Usability test conducted by distributing questionnaires to 25 respondents who have played the Game Folklore Bali I Sangging Lobangkara. Based on the test results the user response is obtained by 91.84% were categorized as very good.

4.3. Problem

During development, there were several problems occurred, such as:

1. The researchers could not develop multi-language features; therefore, this game can only be played by those who understand Indonesian.
2. There was no analysis on the UX (user experience) before the development stage, so there were many revisions during the testing.

5. Conclusion

5.1. Conclusion

Based on the analysis, implementation, and testing in the development of Game Balinese Folklore I Sangging Lobangkara, the conclusion are as follows:

1. Software requirements, software development goals, software input and output, software functional models, game scenarios, navigation structures, character design, storyboarding and interface design were compiled during the software analysis,
2. The game story which contains Balinese folklore I Sangging Lobangkara was based on a book published by Indra Jaya Bookstore entitled 'Satua-Satua Bali (I)' in 1993.
3. The game of Balinese folklore I Sangging Lobangkara was developed using Android Studio IDE with LibGDX framework, resulting in a game that can run on the Android platform.
4. Overall, the user response to the application was very good, seen from the results the percentage of responses from media expert at 98.46%, the percentage of response results from content expert at 95.71%, the percentage of the usability response result of 91.4%. This is because the users gained new knowledge when they use the Game Balinese folklore I Sangging Lobangkara, i.e. knowledge of the Balinese folklore, the moral values of the stories I Sangging Lobangkara as well as an entertainment during their leisure time.

5.2. Recommendation

Based on the observations, there are several things to be considered for further development that can be concluded as follows:

1. Providing multi-language features is advisable in future development, so the game can be played for the people around the world.
2. There should be an analysis on the UX (user experience) so that the developers understand the needs of both design and features that can be developed.

References

- [1] Koentjaraningrat 1979 Pengantar Ilmu Antropologi. Jakarta: Rineka Cipta
- [2] C Kluckhohn 1959 Universal categories of culture. Chicago: University of Chicago Press
- [3] K Saddhono and H Erwinsyah 2018 Folklore As Local Wisdom for Teaching Materialsin Bipa Program (Indonesian for Foreign Speakers) , Int. Conf. Soc. Polit. Issues (the 1st ICSP, 2016), vol. 2018, no. Knowledge and Social Transformation, pp. 444–454
- [4] I N Tinggen 1993 *Satua-Satua Bali (I)*. Singaraja: Indra Jaya
- [5] I G A D Putra 2007 Satua I Sangging Lobangkara dalam Tradisi Nyastra, Soshum J. Sos. and Hum., vol. 7, no. Sosial dan Humaniora, pp. 118–135
- [6] T Grodal 2003 Stories for Eye, Ear and Muscle, In *The Video Game: Theory Reader*. New York: Routledge
- [7] statcounter 2016 *Mobile Operating System Market Share Worldwide: Jan - Dec 2016*, StatCounter GlobalStats, 2016. [Online]. Available: <https://gs.statcounter.com/os-market-share/mobile/worldwide/2016>
- [8] N Smyth 2015 E-Book: Android Studio Development Essentials. eBook Frenzy
- [9] A Oehlke 2013 E-Book: Learning LibGdx Game Development. Packt Publishing
- [10] K Tegeh, I M Jampel, I N Pudjawan 2014 Model Penelitian Pengembangan. Yogyakarta: Graha Ilmu
- [11] J. Schell 2008 e-book: The Art of Game Design. USA: Morgan Kaufmann Publishers