

ANDROID-BASED GAME PUZZLE DEVELOPMENT AS A MEDIA FOR INTRODUCTION OF TOURIST OBJECTS IN JEPARA REGENCY

R Hadapiningradja Kusumodestoni, Adi Sucipto
Faculty of Science and Technology UNISNU Jepara,
kusumodestoni@unisnu.ac.id, adisucipto@unisnu.ac.id

Abstract—Jepara Regency is located in the northernmost end of Central Java Province. Jepara Regency also includes Karimunjawa Islands, which is located in Java Sea. The ground area is 1,004,189 km² with a coastline length of 72 km. Jepara Regency has many tourism places ranging from water tourism, cultural heritage, industrial tourism, culinary tourism, beach tourism and rural tourism which are interesting to visit. Lack of information about tourist attractions in Jepara Regency, making public knowledge about local tourism in Jepara still lacking. To introduce and promote tourist attractions in Jepara Regency to the public and tourists, it is necessary to use an interesting and mobile-based interactive multimedia application, which is named the Local Jepara Tourism Application. Applications can be run on android devices with a minimum operating system of Jelly Bean. This application is tested to experts and respondents get the results of 90.4% of material experts, 100% of media experts and 89% of respondents questionnaires with very decent criteria. The application displays information from tourist objects equipped with puzzle games and quizzes. In the development process the method used in the application is waterfall, using Adobe Flash software to build applications. In further development, the Jepara Local Tourism application needs to be added International languages and maps to tourist sites.

Keyword-Android-based game puzzle, media, tourism Jepara Regency

I. INTRODUCTION

Indonesia is a country which is rich in culture and tourism. Indonesia also has local tourism which is different in each region. Jepara regency is located at the northern end of Central Java, which also includes Karimun Jawa Islands, located in Java Sea. The total area of Jepara regency is 1004.189 km² with the long coastline of 72 km [1]. Jepara Regency has many tourism spots such

as water tourism, cultural heritage, industrial tourism, culinary tourism, beach tourism, rural tourism, which are worth visiting. (<http://jeparakab.go.id>).

To introduce the potential of tourism in Jepara it is necessary to convey tourism information that can be accepted by tourists by using appropriate technology applications that are in accordance with the current situation.

In the journal entitled Design and Development of Interactive Multimedia Applications as Cirebon City Tourism Promotion Media Using Adobe Flash[2], will be produced a desktop-based promotion media, an interactive CD information system. In which there are tourist information that can only be run on a computer [3].

The development of this previous research is an interactive multimedia introduction of tourism objects in Jepara Regency based on mobile (android) by using Adobe Flash software in application development.

II. THEORETICAL BASIS

A. Study Review

In carrying out this research, several similar references were taken as the basis for conducting research: [2] entitled the Design of Interactive Multimedia Applications as Media of Cirebon City Tourism Promotion Using Adobe Flash. In this study the author explains the introduction of local tourism that must be implanted early. However, nowadays many people do not consider the importance of introducing local tourism. The purpose of the Cirebon City Tourism Promotion Application is to facilitate the introduction of Cirebon city

tourism to the people in Indonesia specifically. It is an information system in the form of an interactive CD contains complete tourist information which has not included in the brochure. Moreover, this system can be used while we are in an offline mode [4].

Produced maps to find out the distance of destination and supporting information such as hotel recommendations, and important places in Central Java. The application was built with Adobe Flash CS 5 software. Then the program is tested to find out the errors and checking the smoothness of the program using the Black Box method[5].

The third research was [6] entitled Design of Interactive Multimedia-Based Tourism Promotion Application of Coastal Area in South District of West Sumatra. The author explained quite a lot about tourism objects in the South Coast, such as marine tourism objects, natural attractions, history and culinary.

However, it has not been able to invite local and foreign tourists to flood the tourist locations due to the lack of available sources of information. The author designed and developed the delivery of information (promotion) tourism to the Youth and Sports, Culture and Tourism Office, by utilizing multimedia applications in the form of interactive CDs so people can get a real picture of tourism in South Coastal Area Regency. They also conveyed the information so it can be presented in a more interesting way and how to make maximum use of multimedia technology. The program was created by using AutoPlay Media Studio software. It was developed by combining multimedia objects interactively and interestingly, so as to produce applications in the form of *.EXE then packaged in a CD so that it is more efficient and effective than using brochures.

B. Literature Review

Some of the literature used by the authors in this study are:

1. Multimedia

Multimedia is the use of computers to create and combine text, graphics, audio, moving images (video and animation) by combining links and tools that allow users to navigate, interact, create and communicate [7].

2. Adobe Flash

It is superior multimedia software that was formerly developed by Macromedia, but is now developed and distributed by Adobe System. Flash is usually used to create animation, entertainment and various web components, interrogated with videos in web pages so that it can be a rich multimedia application (Rich Internet Application). The Flash file format is SWF,

usually called the "ShockWave Flash" movie. "Flash movie" or "Flash game", usually files with .swf extension can be run via web, stand alone in Flash Player or run directly on Windows by creating it in the extension .exe format [8].

Adobe Illustrator is a popular vector processing program that is widely used by many people. Sophisticated and complete facilities make Adobe Illustrator in great demand, especially designers. In this CS6 version, Adobe Illustrator presents several new tools and facilities which make it easier to do work with Adobe Illustrator, such as obtaining vector objects, creating illustrations, etc. [9].

3. Action Script

As explained earlier that Flash has a script language called ActionScript. ActionScript shows a collection of sets of actions, functions, events, and event handlers that can be developed by developers to make Flash movies more complex and more interactive. ActionScript evolved into standard programming languages, namely version 1, version 2 and version 3. ActionScript points to one programming style that refers to ECMAScript 4, which is the basis of JavaScript [8].

4. Action Script 3.0

ActionScript 3.0 differences with the previous ActionScript series are written scripts that can only be added to the frame. Whereas if you want a control button, the script is not placed in the button, but through the frame where the button is located, the script writing is neater and grouped. Compilation and grouping of scripts will be easier to find errors in the script that is written and will be easy to edit or change the script [10].

5. Android

Android is an operating system for Linux-based mobile devices that includes the operating system, middleware and applications. Android provides an open platform for developers to create their applications [11].

6. Black Box Testing

Black Box Testing is testing software in terms of functional specifications without testing the design and program code. The test is intended to find out whether the functions, inputs, and outputs of the software are in accordance with the required specifications [12].

III. RESEARCH METHODS

In developing the application the method used is the waterfall with the stages of Requirements, Design, Implementation, Verification, Maintenance. The implementation of the entire procedure for developing this research in detail is as follows:

A. Requirement

This application is intended for users (users) for the public or the wider community of Jepara people and tourists. With this application, the introduction of tourist objects is more interesting because it has an attractive appearance with animation, text, and audio, also equipped with quizzes for tourism and travel puzzles in it.

1. Material Needs Analysis

The materials needed to build applications include:

- Data on names and explanations of tourism objects in Jepara Regency
- Images or photos according to each tourist attraction in Jepara
- Sound or audio description of attractions

A. Design

The design phase is the application design phase that will be created, including the creation of an overall media design (Storyboard) component compilation in interactive multimedia in the form of pictures, text and audio that will be included in the application.

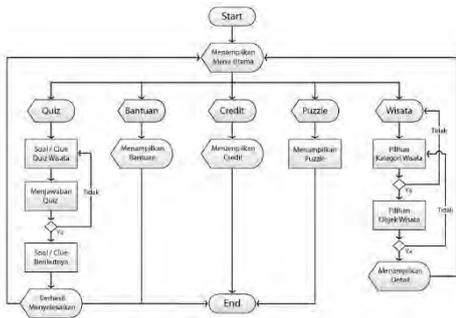


Figure 4.1 Flowchart

1. Storyboard Design

Storyboard has a purpose as a guide so as to facilitate the process of making media, the Storyboard design of the application is as follows:

a. Start Page Storyboard

The following is the storyboard of the application's initial menu page:

Table 4.1 Application Start Page

Application Start Page		
No	Design Page	Information
1.		1. Exit button to exit the application. 2. Mute button or play bakcsound application. 3. Image logo of the Jepara Local Tourism application. 4. Start button to start the application.

b. Storyboard Main Menu Page

The following is the application's main menu page storyboard:

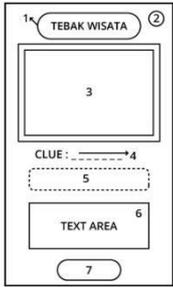
Table 4.2 Main Menu Page

Main Menu page		
No	Design Page	Information
2.		1. Exit button to exit the application. 2. Picture the application logo. 3. The button goes to the quiz page. 4. Button to go to the help page. 5. The button goes to the credit page 6. The button goes to the puzzle page 7. The button goes to the travel category page 8. The button goes to the beginning of the page (Splash Screen) application.

c. Storyboard Menu Quiz page

The following is the story of the application quiz menu page:

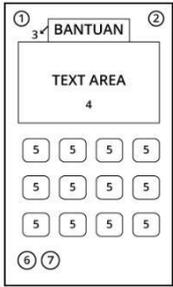
Table 4.3 Quiz Problem Pages

Menu Quiz Problem page		
No	Design Page	Information
3.		<ol style="list-style-type: none"> 1. Quiz header page image. 2. The button goes to the main menu page. 3. Travel pictures on the quiz page. 4. Clue of tourist matters (letters in tourist names are incomplete). 5. Input text area (to answer tour name). 6. Clue explains about travel. 7. The next button to go to the next question.

d. Storyboard Help Menu page

The following is the storyboard of the application help menu page:

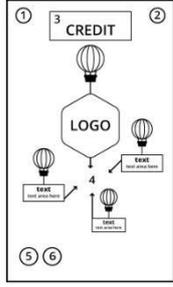
Table 4.4 Help page

Help Menu page		
No	Design page	Information
4.		<ol style="list-style-type: none"> 1. Exit button to exit the application. 2. The button goes to the main menu page. 3. Picture the help page header. 4. Displays a description of each button in the Jepara Local Travel application. 5. Button from the application to find out its function. 6. Button to the beginning of the page (Splash Screen) application. 7. The button returns to the previous page / menu.

e. Storyboard Menu Credit page

The following is the storyboard of the application menu credit page:

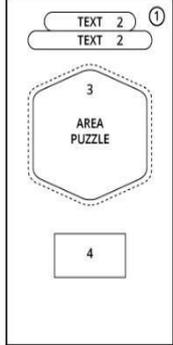
Table 4.5 Page Credit

Menu Credit page		
No	Design page	Information
5.		<ol style="list-style-type: none"> 1. Exit button to exit the application. 2. The button goes to the main menu page. 3. Credit page header image. 4. Logo images and additional content sources needed by the Jepara Local Tourism application. 5. Button to the start of the page (Splash Screen) application. 6. The button returns to the previous page / menu.

f. Storyboard Puzzle Menu Page

The following is the application puzzle menu page storyboard:

Table 4.6 Puzzle Pages

Puzzle Menu page		
No	Design page	Information
6.		<ol style="list-style-type: none"> 1. The button goes to the main menu page 2. Instructions for composing a puzzle. 3. The area where the puzzle is composed. 4. Enter key to continue to the next puzzle.

g. Storyboard Tourism Object Page

Following is the storyboard of the application object page:

Table 4.7 Tourist Objects

Tourist Object page		
No	Design page	Information
7.		<ol style="list-style-type: none"> 1. The button goes to the main menu page. 2. Pictures of selected tourist objects. 3. Explanation of tourist objects. 4. Button to the start of the page (Splash Screen) application. 5. The previous button to return to the previous attraction. 6. Description of tourist object numbers. 7. Next button to the next tourist attraction. 8. The button returns to the previous page / menu.

h. Storyboard Exit Application

The following is the storyboard of the dialog box page coming out of the application:

Table 4.8 The dialog box confirms the application exit

Tourist Object page		
No	Design page	Information
8.		<ol style="list-style-type: none"> 1. Confirm dialog box, whether you want to exit or not. 2. The functioning button cancels out of the application. 3. Button that functions becomes out of the Jepara Local Tourism application.

2. Collection of Material

The step of material collection that suitable with your needs. These materials are, background images, logos, icons, and buttons that make use of Adobe

Illustrator CS6 software, also requires tourist photos and audio as back sound applications.

IV. DISCUSSION RESULT

A. Application Implementation

Following is the implementation when running on an Android device

1. Initial Application Display

The initial appearance of the application that appears when run and to start the application by clicking the start button.



Figure 4.2 Application Start Page

2. Main Menu Page Display

There are several button choices to enter the menu page according to the button that has been selected.



Figure 4.3 Main Menu Page Display

3. Display Quiz Guess Travel Guides

On the quiz menu, the user must answer the tourist name of the clue in the typing column that has been provided under the tourist image.



Figure 4.4 Display Quiz Guess Travel Guides

4. Help Menu Display page

Help menu page to find out the functions of each button and menus on the application.



Figure 4.5 Display of the Help Menu Page

5. Menu Credit Menu Display

This page displays the additional content sources needed by the application.



Figure 4.6 Display of Menu Credit

6. Puzzle Menu Page Display

To complete the puzzle the user must choose the right piece of the picture and drag it to the right position.

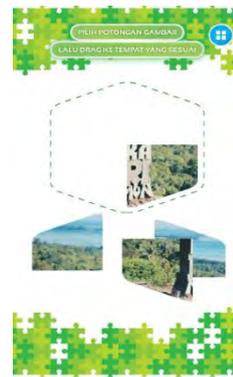


Figure 4.7 Puzzle Menu Page Display

7. Tourism Object Page Display

The appearance that appears when the user chooses one of the tour options that is on the travel options menu page. In this view the user is given description information from the application along with the audio description of the attraction.



Figure 4.8 Tourism Page Display

8. Display Exit Application

The display when the exit button is clicked will display a confirmation display whether it is sure to exit the application, the red button means it will not leave the application, while the green button means exit the application.



Figure 4.9 Application Exit Display

B. Blackbox testing

The following are the results of black box testing testing on Jepara Local Tourism applications:

No	Pengujian	Hasil Yang Diharapkan	Hasil Pengujian	Kesimpulan
1.	Icon aplikasi	Muncul pada <i>device android</i>	Muncul pada <i>device android</i>	valid
2.	Menekan <i>icon</i> aplikasi	Muncul halaman awal aplikasi	Muncul halaman awal aplikasi	valid
3.	Menekan tombol <i>start</i>	Menampilkan halaman menu utama aplikasi	Muncul halaman menu utama	valid
4.	Memilih salah satu menu	Menampilkan halaman menu sesuai yang dipilih	Muncul halaman menu yang dipilih	valid
5.	Memilih menu <i>quiz</i>	Menampilkan halaman menu <i>quiz</i>	Muncul halaman menu <i>quiz</i>	valid
6.	Memilih menu bantuan	Menampilkan halaman menu bantuan	Muncul halaman menu bantuan	valid
7.	Memilih menu <i>credit</i>	Menampilkan halaman menu <i>credit</i>	Muncul halaman menu <i>credit</i>	valid
8.	Memilih menu <i>puzzle</i>	Menampilkan halaman menu <i>puzzle</i>	Muncul halaman menu <i>puzzle</i>	valid
9.	Memilih menu wisata	Menampilkan halaman menu kategori wisata	Muncul halaman menu kategori wisata	valid
10.	Memilih salah satu kategori wisata	Menampilkan halaman pilihan wisata sesuai kategori yang dipilih	Muncul halaman pilihan wisata sesuai kategori yang dipilih	valid
11.	Memilih salah satu wisata	Menampilkan detail objek wisata	Muncul detail objek wisata	valid
12.	Tombol home	Kembali ke halaman awal aplikasi	Berfungsi	valid
13.	Tombol toggle sound	Mengaktifkan atau non aktifkan audio <i>background</i> aplikasi	Berfungsi	valid
14.	Tombol keluar	Keluar dari aplikasi	Berfungsi	valid
15.	Tombol main menu	Kembali ke menu utama	Berfungsi	valid
16.	Tombol kembali	Kembali ke halaman atau menu sebelumnya	Berfungsi	valid

Table 4.9 Testing Black Box Testing on Applications

C. Validation of Application Feasibility

The appraisal of the feasibility of the Jepara Local Tourism application is carried out by material experts, media experts and respondents' questionnaires, following the test table that has been tested:

No	Ahli	Instrumen	Skor Ideal (n)	Skor Ahli (f)	Persentase (%) (P)	Kriteria	Keterangan
1.	Materi	7	21	19	90,4 %	Sangat Layak	• Tambahkan bahasa asing (Bahasa Inggris) • Lokasi tempat wisata, map menuju tempat wisata itu.
2.	Media	9	27	27	100 %	Sangat Layak	• <i>Quiz</i> dan <i>puzzle</i> sebaiknya urutannya di acak, karena jika simakan 10x pasti hapal.
3.	30	10	1500	1349	89,9 %	Sangat Layak	

Table 4.10 & 4.23 Expert Validation & respondent questionnaire

D. Maintenance

After testing the material experts, media experts and the results of the respondents' questionnaires from 30 users were circulated, there were criticisms and suggestions regarding the maintenance of the application that had been made by the researcher. For this reason improvements have been made regarding criticism and suggestions from the two experts and the results of the respondents' questionnaire, so that the Jepara Local Tourism application that researchers have completed can be used properly.

V. CONCLUSIONS & SUGGESTIONS

A. Conclusion

The conclusions obtained from the research that has been made Interactive Multimedia application as an

introduction to tourist objects in Jepara District based on mobile (Android), which is named Jepara Local Tourism as a medium of information for people and tourists. This application can be run on android devices with a minimum operating system Jelly Bean. Jepara Local Tourism Application can display brief information about existing tourism objects in Jepara Regency. Besides displaying information from tourism objects in Jepara, this application is also equipped with puzzle games and quizzes about tourism in Jepara Regency.

Jepara Local Tourism Application has been tested and assessed by material experts, media experts and carried out the distribution of 30 respondents' questionnaires and produced the following criteria:

1. The results of expert material testing get a percentage of 90.4% with the criteria of the application is very feasible.
2. Test results of media experts get a percentage of 100% with very decent application criteria
3. Questionnaire respondents get 89.9% percentage results with very feasible application criteria.

B. Suggestions

Jepara Local Tourism Application is still very far from the perfect word, suggestions can be given for this application as follows:

1. In the further application development, in order to add International language (English) to facilitate users who do not master Indonesian.
2. Applications should be added to the map feature to the location of attractions that are integrated with Google Map.
3. Quiz and puzzle should be randomly arranged in order to prevent users from repeating the same pattern so that it is not easy to remember.

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