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pp526-535 ? 526 Indonesian Culture Learning Application based on Android Alexander Setiawan, Andreas Handojo, Rendra Hadi Informatic Engineering Department, Petra Christian University Surabaya, Indonesia
Article Info ABSTRACT Article history: Indonesia is a country that has a wealth of diverse cultures spread from Received Aug 26, 2016 Sabang to Merauke. Even though the government has included a lesson about Revised Nov 15, 2016 Indonesian culture in terms of some subjects such as Art and Culture, but there are still many people including some students who do not know the Accepted Dec 1, 2016 forms and names of the tribes, traditional houses, traditional clothing, folk songs, traditional foods, local weapons, and musical instruments regions in Keyword: Indonesia. Therefore, a learning application is created that utilizes mobile learning technology. Through the used of mobile learning, user can access Android learning content without any borders so that it can be accessed at any time so Application that it can be accessed at any time with interesting illustration. Indonesian Indonesian culture National Culture Application is made useful to help users in learning the Mobile learning introduction of Indonesian culture that provides the knowledge with illustrations

in the form of images, audio, **text and video. This**

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application also can be functioned to learn, answer quiz, to view a gallery of images and video and to do puzzle games. The achieved result is an application that can provide knowledge to the users so they can know the culture in Indonesia through the illustrations provided well.

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1. INTRODUCTION Indonesia is a country that has a wealth of diverse cultures spread from Sabang to Merauke. Property owned by the people of Indonesia is not only a wealth of natural resources, but the people of Indonesia also have a wealth of other such cultural richness Indonesian tribes scattered throughout the Indonesian archipelago. Indonesia also said that the country deserves to be called emerald of the equator. In addition to its beauty, the thousands of islands spread from Sabang to Merauke [1]. All saving potential agricultural products, the unique flora and fauna diversity. Not only that, Indonesia is also rich in ethnicity, language, customs, and culture [2]. Each region has its own culture and tradition which is the heritage and legacy of the ancestors. Some examples of the various cultures are traditional houses, traditional clothing, traditional dances, local weapons, and musical instruments regions [3]. Although the government has included a lesson about Indonesian culture in subjects Art and Culture, but there are still a lot of the general public as well as students who do not know the form and name of the tribes, traditional houses, traditional clothing, folk songs, traditional foods, local weapons, and musical instruments regions in Indonesia. Indonesia is currently divided into 34 provinces and has a diverse culture. Problems that occur since there are many kinds of cultures, regions or provinces and the number of population do not cover the possibility that not all Indonesian, especially children are able to recognize and to know clearly about the whole region and the culture of Indonesia well. And nowadays, Indonesia has been divided into 34 provincial certainly adds to the list of cultural diversity in Indonesia.

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The development of information and communication technology is growing very rapidly in this era of globalization. Rapid development is also an impact on various aspects of life including education. One way is to utilize mobile learning technology. Through the used of mobile learning, the user can access learning content without any borders so that it can be accessed at any time so that it can be accessed at any time with interesting illustration where learners can access learning materials, referrals and applications relating to learning, anytime and anywhere

in the form of text, image, audio and video

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[4]. Based on these problems a learning media application developed in this paper to help the people interest in knowing the culture of Indonesia with a mobile device on Android. Where this application has features that learn, gallery, quiz and puzzle game. 2. RELATED RESEARCH In this chapter, the mobile learning technology and related technology required for the design and implementation of a mobile learning based on Android will be discussed. 2.1. System Design In this system the user can use the application "Indonesian National Culture" online and there are a few of features that can be accessed offline, after receiving

data from the server and stored in a local database. The task of the

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admin is to do insert, update, delete, view information on mobile learning applications are provided through a web browser. In a system of admin user can view information - information about the kind of culture that is selected, and the user can also answer quizzes and puzzles via Android. Admin tasks that perform insert, update, delete illustrations and questions from the quiz. The outline of the application system design can be seen in Figure 1. Figure 1. System Design "Indonesian National Culture" Application

Nowadays, Mobile Learning has become an important issue. This is because it has the many valuable benefits. First, it allows students learn at any time and any place. Second, students can save their time. Third, fast learning can be achieved through mobile communications. Fourth, using mobile phone is more flexible rather than PC. Finally, the concentration of students is more increasingly when using mobile learning

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[5]. "Indonesian National Culture" application will display the menu required by the user, in this case the information regarding the introduction of Indonesian culture that is tribes, traditional houses, traditional clothing, folk songs, traditional foods, local weapons, and musical instruments regions in Indonesia through illustrations of text, image, audio, and video. a. Text Most mobile now supports the use of text. Almost all mobile phones in circulation today have supported the use of SMS. Relatively small memory requirement includes text-based content more easily implemented [4]. b. Image Mobile devices that exist today have a lot to support the use of images. The quality of images that can be displayed may vary from the type of monochrome (black and white) Based Learning Mobile Learning to high-quality color images depending on the capabilities of the device. The image files are supported by the device are generally of type PNG, GIF, JPG. The use of images as learning content is usually bundled with other content, such as text [4]. c. Audio Many mobile devices now supports the use of audio. Some types of files that are typically used in the mobile environment, among others, RM, MP3, AMR and others. Therefore, audio files usually have a fairly large size, causing the audio file to be processed first so that it can be used in the mobile devices that have a relatively small memory capacity [4]. d. Video Although the quality and limited size, some types of mobile devices have been able to play video files. The file format supported by mobile devices, among others, 3GP, MPEG, MP4, and others. Just as audio files, most video file has a size large enough to be converted and adapted to the limitations of the device [4]. 2.2. Android In general, application of "Indonesian National Culture" is used to introduce culture in Indonesia using mobile learning technology. This application is designed to facilitate the introduction of Culture in Indonesia, aimed at students and people to provide information to users. In building this application program using

Android. Android is an operating system developed by

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Google, which promises openness, affordability, open source, and quality framework,

to meet the needs of the operating system that supports standard and

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publishing APIs and can be utilized as a whole with low cost [6].

Android provides an open platform for developers to create their own applications. Initially developed by Android Inc., a

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firm

newcomers who make software for mobile phones

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which was later purchased by Google Inc. For its development,

formed the Open Handset Alliance (OHA), a consortium of 34 hardware companies, software companies, and telecommunications, including Google, HTC, Intel, Motorola, Qualcomm, T-Mobile, and NVIDIA [7]. The open nature of Android

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that has made a large number of communities have sprung up application developers to use Android as the basis for the project of making applications, by adding new features for Android on the devices officially released by using another

operating system [8]. Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language

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[9]. 2.3.

JSON (JavaScript Object Notation) JSON (JavaScript Object Notation) is a format for data exchange

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such as XML. JSON is very easy understandable by humans, because the format is simple. Not only humans, machines can read JSON very easily. This format

is based on part of the JavaScript programming language, Standard ECMA-262 Edition 3 December 1999. JSON is a text format that is independent

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of any programming language because it uses the style language that is commonly used by programmers class C including C, C ++, C #, Java, JavaScript, Perl, Python and others [10]

JSON is built on two structures: a. A collection of name / value pairs.
In some programming languages, this is realized as an object (object), record, structure (structure), dictionary (dictionary), hash

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tables, lists key (key

list), or associative array. b. List of values sequentially. In most programming languages, it is declared as an array, vector (Vector), lists (list), or sequences (sequences). These data structures

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referred to as a universal data structure. Basically,

all modern programming languages support this data structure in the form

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of the same or different. It deserves to be called so because the

data format is interchangeable with programming languages are also based on

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this data structure [11]. 2.4. AJAX AJAX is a technique to make the display more quickly and dynamically. AJAX allows the display can perform updates by exchanging small amounts of data. The advantage of using AJAX is able to reload in a section on the display without having to refresh the entire page. The goal is to move most of the interaction on a computer web surfer, to exchange data with the server behind the scenes, so that the web page does not have to be read as a whole every time a user makes a change. This will increase interactivity, speed, and usability [12]. AJAX is a combination of: a. DOM accessed with a client-side scripting language to dynamically display and interact with information displayed. b. Objects from Microsoft XMLHttpRequest more commonly implemented in some browsers. This object is useful as a vehicle exchange of data asynchronously with the web server. In some frameworks AJAX, HTML IFrame element preferred over XMLHttpRequest to exchange data with the web server. Webserver is a provider of a web service through HTTP or HTTPS protocol. Webserver system will be accessible through Location Based Service. Webserver to be used is already integrated with Apache PHP components [13] c. XML is commonly used as a transfer document, although other formats are also

possible, such as HTML, plain text. XML is recommended in the use of AJAX techniques for handling ease of access by using DOM d. JSON can be an alternative choice as a transfer document, given JSON is JavaScript itself making handling easier. 2.5. Menu of Learn In Figure 2 is a process flowchart of the learning menu. Figure 2. Flowchart Menu of Learn Users can choose a province located in Indonesia map with zoom feature maps and map search by name of the province and after selecting a province of the display will appear category desired by the user and the information provided

in the form of illustrated text, images, audio and video.

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Once the user selects one of the provinces that want it will show a list view category type of culture of the province that has been selected. In this menu in Figure 2, the user can begin to learn to know the cultures that exist in Indonesia by way of illustration and materials given. 2.6. Menu of Game Menu game on this application has 3 difficulty levels are easy, medium, hard. After the user selects from these levels it will show the game menu that contains a puzzle of the image culture performed at random. There is a timer in a puzzle game, when the time runs out then the application will proceed to calculate the scores and displays the score and after that will perform high score. In this menu in Figure 3, the user can begin to play game puzzle. Figure 3. Flowchart Menu of Game 3. ANALYSIS AND RESULT 3.1. Analysis of Needs a) Make Android based mobile application that can be easily accessed by the user so as to facilitate the recognition process through the application of learning introduction to the culture of Indonesia. b) In this application the necessary features to provide knowledge quiz in the form of images and sound so that the user can learn and remember more about the learning through questions given and practical for use on mobile learning applications. c) Necessary also a puzzle game on mobile learning applications so that users can get to know the culture of Indonesia through the game. This game is played by disassembly that where the object of the illustration image is scrambled and the user must reconstitute the original to form with different difficulty levels (easy, medium, hard) and save high score in a local database. 3.2. Result This page is the main page in the Android application, which this program has five main menu. The menu is a menu of learning, menu of quiz, menu of gallery, menu of login and button of exit, where for each - each button is selected to show the new page except the exit button. Figure 4 is an initial view of mobile applications. On this page the user does not have to log in first, before going on a page that is displayed in Figure 4. All the features - features on the mobile application in Figure 4 displays illustrations that help the user to know the culture of Indonesia. Figure 4. Main menu Indonesia National Culture Figure 5. Display Select Province All features - features on the mobile application in Figure 4 displays illustrations that help the user to know the culture of Indonesia. After user clicking the menu of learn on the Android App can be seen in Figure 8. In the navigation menu to learn there are three buttons, namely search and list the provinces in the page header learning, learning button and open and download the material. Shown in Figure 5 shows Indonesia map image that can be selected by the user before selecting the desired category through the points already established on the coordinates of the map image. From that point, the user may be searching information through the coordinate point that is placed in every province in the image map. After clicking on one of the buttons will appear province and category information in the form of illustrations vary based on the category and selected provinces. For information to be provided in the form of images can be seen in Figure 8, the information will be provided in the form of sound and image instrument music area can be seen in Figure 7, and information to be provided in the form of video on regional dances can be seen in Figure 6. Figure 6. Illustration of Video Figure 7. Illustration of Audio Figure 8. Illustration of Image Information is a sound illustration of the appearance of the category and type of culture of local music instrument. On this page is displayed sound of musical instruments, musical instruments pictures and

detailed information so that the user can better know the culture in Indonesia through the illustrations and the votes cast. Can be seen in Figure 8. In Figure 6 is an illustration of a video display in one of the categories that have been selected by the user on the menu to learn. These videos come from the province of East Java who played through streaming www.youtube.com. Figure 9. Select of Material Figure 10. Select of Album Figure 11. Pop Up of Image In Figure 9 is a display feature "Open & Download Content" externally so that it can be applied in open PDF mobile applications. So that the material that has been downloaded can be opened at any time without having to be online again. The material that is given comes from all provinces in Indonesia and the user starts to choose the category of the desired material. Can be seen in Figure 9 categories of materials as follows: Tribe PDF, Traditional House PDF, Traditional Clothing PDF, Foods PDF, Weapons Regional PDF, Local Songs PDF, Local music PDF, Region dance PDF. In Figure 10 is shown a couple of different categories of cultural traits can be selected by the user. Once the user selects the category it will show the sets of images that have been selected category. Users are asked to choose one of the rendered image after the image is selected it will pop up as Figure 11. Figure 12. Puzzle level hard Figure 13. Quiz Guess Sound Figure 14. Pop Up of Gallery Figure 13 and Figure 14 is a guess quiz show of images where users are asked to answer the questions of questions about the Indonesian culture of a given category of quiz guess the picture .When the user has to choose one category will display a matter of question, the user is asked to answer the question the. If the answer is correct then the user will be assigned the points 20 if one then get points 0. Also features help to facilitate this quiz between 50:50 and pass a feature. 50:50 feature is useful for removing 2 wrong choice answer while the pass feature that questions can be skipped. And the number of questions will be increases one and will be shown at the end of the question because accommodated in a temporary array. In Figure 12 is an hard puzzle game show. Once the user selects the menu will display a selection of games, namely puzzles categories: easy, medium and hard. Users are asked to select one of the categories of difficulty levels after the user selects a category hard it will appear in Figure 12. These objects are randomly assigned by the system every time into the game so that the object of the puzzle that can be fickle. Here are only displayed images on the hard level of difficulty, because function of the level of difficulty easy, medium and hard almost the same, the difference is the number pieces of the illustration object. Difficulty level of easy featuring 4 fractions, Difficulty level of medium displays 9 fractions and Difficulty level of hard feature 16 fractions. The game begins after the user presses on the image of the object after the object of the puzzle in the shuffle so that the pieces of the pictures to be rewritten by the user. When users have finished arranging puzzle user will get points 100. Upon completion of this puzzle will appear highscore game page similar to Figure 15 highscore pages and after displaying highscore then there is a button "Statistics" whose function is to look back at the scores that have been passed on such games. page of statistics about the same in Figure 16 charts showing statistics quiz. Figure 15. High score of guess image Figure 16. Chart of quiz guess image Figure 17 is an Admin login page views. Admin is expected to fill a textbox, if successful admin will go to the Home page. Admin can perform insert update and delete content. If administrator choose the features it will display the video view as in Figure 18. Figure 17. Login admin website Figure 18. View illustration of video in admin site In Figure 18 is displayed pictures showing details of the data illustrated so that admin can more clearly in view the data in the table. This feature displays the name of illustration, information and status of one of the data of the illustration of video. Android device testing is done by using Android 4 devices, among others, Xiaomi Redmi 2, LG Optimus G Pro, Samsung Galaxy A5, OnePlus 2. Specifications devices

Table Specifications Device Operating Display Size CPU Memory Internal System XIAOMI REDMI 2 Android 4.4 (KitKat) LG OPTIMUS G Android 4.4 PRO (KitKat) Samsung Galaxy A5 Android 5.0 (Lollipop) OnePlus 2 Android 6.0 (Marshmallow)

720 x 1280 pixels (~312 ppi pixel density) 1080 x 1920 **pixels (~401 ppi pixel density)** 720 x 1280 **pixels (~294 ppi pixel density)** 1080x 1920 **pixels (~401 ppi pixel density)**

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Quad-core 1. 2 GHz Cortex-A53 Quad-core 1. 7 GHz Krait 300 Quad-core 1. 2 GHz Cortex-A53 Quad -core 1.82 GHz Cortex-A57

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16GB storage, 2 GB RAM 32/16/GB storage, 2 GB RAM 16 GB storage, 2 GB RAM 64 GB storage, 4 GB RAM 4. CONCLUSION At the end of the design and development of application program for Indonesian National Culture, some conclusions can be drawn through the test. a. Application requires an Internet connection which is fast enough for streaming video used to be. b. The application runs well on Android operating system 4.4 (KitKat) to the operating system 6.0 (Marshmallow). c. 85% of users found the overall value of the application is very good. Applications are able to provide cultural information in an interesting and useful for people. d. The application requires an internet connection that is fast enough for streaming video used to be. Application has been made a little run slowly because it takes a long time to display the captured video on www.youtube.com. REFERENCES [1] Rizky, R., & Wibisono, T. 2012. Mengenal Seni & Budaya Indonesia. Jakarta: Penebit CIF. [2] Rizky, R., & Wibisono, T. 2015. Mengenal Seni & Budaya 34 Provinsi di Indonesia. Jakarta: Cerdas Interaktif. [3] Prabowo R, Listyorini T, Ahmad J. Pengenalan Rumah Adat Indonesia Berbasis Augmented Reality dengan Memanfaatkan KTP sebagai Marker. Jurnal Simetris. 2015; 51-58. [4] Setyoko. 2012. Pembelajaran Berbasis Mobile Learning. Retrieved May 21, 2016 from <https://id.scribd.com/doc/126520370/pembelajaran-berbasis-mobile-learning>. [5] Ahmed A, Hazem M. A Novel Adaptive Mobile E-Learning Model Based on Developed Learner's Styles. Bulletin of Electrical Engineering and Informatics. 2013; 2(2); 141-157; [6] Huda U. Design of Prototype Payment Application System with Near Field Communication (NFC) Technology based on Android. Computer Engineering and Application Journal (ComEngApp). 2012; 1(1); 1-12. [7] Safaat, N. 2014. Pemrograman Aplikasi Mobile Smartphone dan Table PC Berbasis Android Revisi Kedua. Bandung: Informatika Bandung. [8] Salbino, S. 2014. Buku Pintar Gadget Android untuk Pemula. Jakarta: Kunci Komunikasi. [9] Teddy M, Andri Z., Securing E-Mail Communication Using Hybrid Cryptosystem on Android-based Mobile Devices. TELKOMNIKA Indonesian Journal of Electrical Engineering. 2012; 10(2); 827-834. [10] Oracle. 2014. Introducing Oracle. Retrived March 2, 2014 from <https://www.oracle.org>. [11] JSON. 2014. Introducing JSON. Retrived March 2, 2014 from <http://www.json.org>. [12] W3schools. AJAX Introduction, 2016. URL=http://www.w3schools.com/Ajax/ajax_intro.asp. [13] Ahmad F, Sri D, Dieka R. Location Based Service for Information Publication Using GPS On Android-Based Mobile Phone. Proceeding of International Conference on Electrical Engineering, Computer Science and Informatics (EECSI). 2014; 1(39); 190-197 BIOGRAPHIES OF AUTHORS Alexander Setiawan – Obtained his Bachelor Computer degree in Informatics Engineering from Petra Christian University, Surabaya, Indonesia in 2003. He received his master, in Information Technology from Gadjah Mada University, Yogyakarta, Indonesia, in 2008. Now, he served as Assistant Professor and a lecturer in the Department of Informatics Engineering at Petra Christian University, Surabaya, Indonesia. His primary research interest are in software engineering,

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