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Android-Based Application for Intangible Cultural Heritage in Balai Pelestarian Nilai Budaya Jawa Barat

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Abstract. The main purpose of this study is to help Balai Pelestarian Nilai Budaya (BPNB) Jawa Barat in preserving the Intangible Cultural Heritage (ICH) in Indonesia. BPNB Jawa Barat manages four provinces in Indonesia namely Banten, DKI Jakarta, Jawa Barat, and Lampung. This Android application aims to disseminate information regarding ICH aspects which includes history, location, maestro, and the distribution of ICH in the four provinces. The method used in application development is the Unified Process which is carried out in several phases, namely Inception, Elaboration, Construction, and Transition. The design of an Android application uses Unified Modeling Language (UML) as an application modeling. The application uses Google Maps API and coordinates stored in the database to display the locations of ICH on the map. The application has been tested using Black Box and User Acceptance Test (UAT) method, and based on the test results it can be concluded that the application can help the user to obtain information about aspects of the Intangible Cultural Heritage.

Keywords: Android, BPNB, ICH, Unified Process, UML

1. Introduction

The main purpose of this study is to help BPNB Jawa Barat disseminate information on aspects of the ICH to the general public. ICH associates with tradition and living expressions, that is transmitted from one generation to the next ones. ICH have a great significance in facilitating the emotional and sentimental attachment to a nation within tourism context, and one of the most potential strategy in preserving and disseminating information about the ICH is the use of advanced digital technology [1], [2]. Advanced digital technology can be used to archive and transmit information about the ICH to future generations. One of the advanced technology that can be used to preserve ICH is mobile technology. Mobile technology provides instant access to information across boundaries. It can be used as a digital library that can be accessed anytime and anywhere [3]. Indonesia is one of largest mobile markets in Asia, with about 62,4 percent of the population owning and using a mobile phone in 2018, and among the adolescents in Indonesia (middle and high school students), more than 80 percent students already own smartphones and laptops [4], [5]. This application was developed using native Android, rather than hybrid development. As of 2019, Android held over 90 percent market share in Indonesia, with smartphone giants such as Samsung, Oppo, and Xiaomi dominating the market. Native development was used to develop the application, since it can fully utilize the resources available on the smartphone such as location based services, camera, messaging, and optimize the user interface composition time as well as networking performance within the smartphone



itself [6], [7]. With the development of this application, it is hoped that the application helps BPNB Jawa Barat to disseminate and preserve ICH values using mobile technology.

2. Method and materials

2.1 Development methodology

The development methodology for this application uses the Unified Process methodology with Unified Modelling Language (UML) as the modelling notation. In the Unified Process, system will be built incrementally and uses many iteration in its development phases [8]. The Unified Process also provides instructions on how to use UML effectively, and enabling the developer to systematically control changes that occurs during the development phases [9]. The Unified Process has four phases that consists of:

2.1.1 Inception Phase

This phase focuses on setting the scope and vision of the project. In this phase, the developer determines the scope of the application, as well as observing the Administrator Dashboard that is already available and analyzes it to provide information into the Android-based application.

2.1.2 Elaboration Phase

The elaboration phase focuses on the analysis and design of the application to be developed. In developing the ICH Android-based application, the UML was used to design the processing model. Use Case diagram (figure 1) was used to identify the use cases for the application, as well as identifying the actors involved in the application. The User Interface (UI) planning is also done in this phase. The planning aims to create a visual aesthetic of the UI to help the user perceives and uses the application effectively, without sacrificing power consumption and the data traffic of user's smartphone [10], [11].

2.1.3 Construction Phase

This phase focuses on the development of features based on the Use Case diagram. The application was developed using the Java and XML language, and uses MySQL as a database for the data storage. After the application is completed, testing is done by Black Box Testing and User Acceptance Testing.

2.1.4 Transition Phase

The final phase in the Unified Process focuses on the implementation of the application such as distribution and installation. After the testing was complete, new iteration was made to refine the application based on the testing results done by the developer and users.

2.2 Data Materials

The data used in this application is provided by BPNB Jawa Barat. These data include the category and sub-category of ICH, the cultural workshops, maestros, cultural records, and cultural establishment.

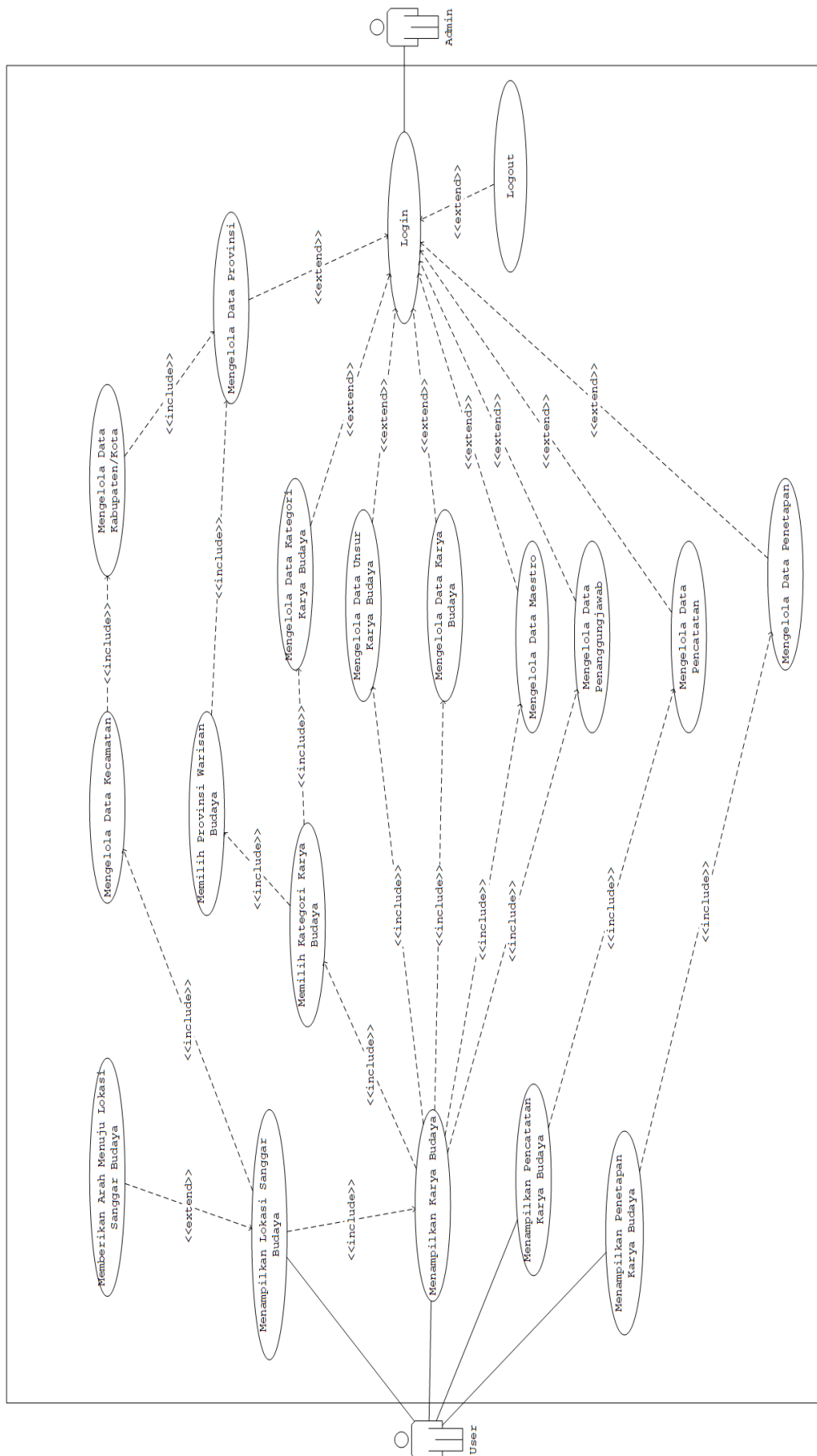


Figure 1. Use Case Diagram

3. Results and discussion

3.1 Displaying ICH Aspects and Locations

The main page of the application displays all the features that the user can access including displays and search of cultural works or maestros, selection of cultural works based on Province and ICH domain, distribution of cultural works, records and establishment of cultural works, and cultural works clustering (figure 2).



Figure 2. Main Page of the ICH Application

- A.** Displays and Search of Cultural Works or Maestros **B.** Provinces Managed by BPNB Jawa Barat **C.** Cultural Records, Establishment, Distribution, and Clustering.

This application uses MySQL and online hosting to store and read data regarding ICH aspects. It displays details of cultural works such as pictures, history, elements, descriptions, cultural maestros, and workshops, while the workshop detail displays the address, telephone number, email, and workshop locations. To display the location on the map, the application reads the coordinates that have been stored in the database and display the marker based on the workshop's coordinate using Google Maps API. Location Based Services are also used to get the user's current coordinate. The application uses the marker and the user's coordinate to generate a route between the user's location and the cultural workshops location (figure 3).

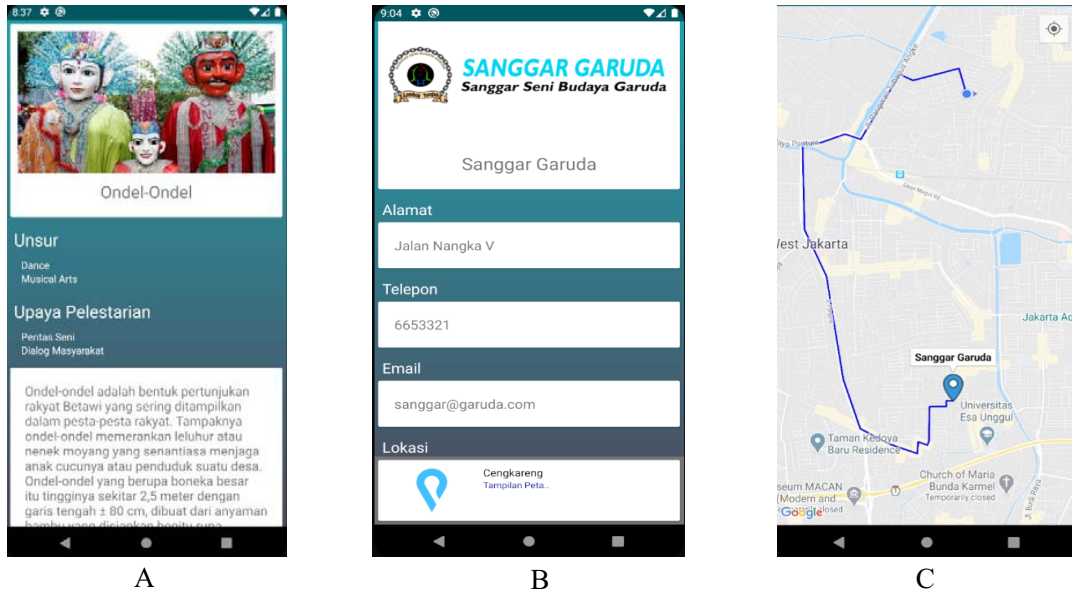


Figure 3. Cultural Details and Locations

A. Displays Cultural Works and Details **B.** Cultural Workshops and Details **C.** Markers and Routes from the User’s Location to the Workshops’ Location

This application can also display the distribution of ICH workshops based on the closest location of district offices. The users need to select of the sub-districts of the BPNB Jawa Barat working Provinces and its Cities. The application automatically displays all of the nearest markers based on the user’s selection. The markers has been categorized with domains of the ICH, and user can choose one of the markers to display the details of the ICH workshop (figure 4).

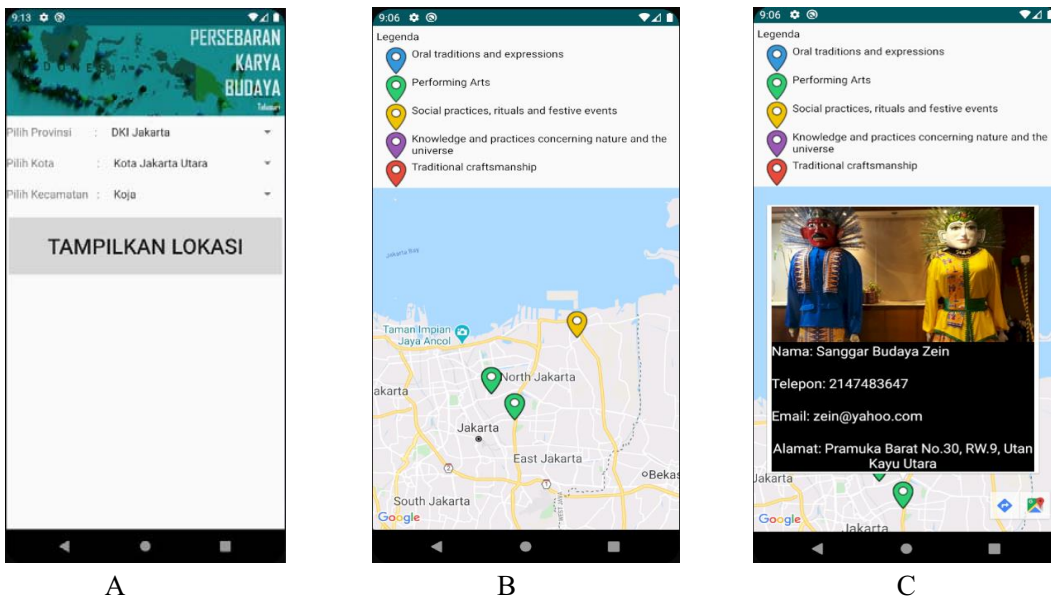


Figure 4. Distribution of Cultural Workshops Based on Sub-Districts

A. Sub-District Selection Based on Cities and Provinces **B.** Marker Display Based on Selected Sub-District **C.** Detailed Information About the Workshop Based on Marker

4. Conclusion

The application provides details and informations about the ICH and the workshop locations via the user's smartphone. It helps the general public to search about informations and helps BPNB Jawa Barat preserve and disseminate ICH. The application also provides records and establishment of the ICH in BPNB Jawa Barat.

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