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SENTRAS (ASEAN TOURIST ATTRACTIONS) : GIS APPLICATION FOR OPTIMIZING ASEAN TOURISM USING GOOGLE MAPS API V2 BASED ON ANDROID OPERATING SYSTEM

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Geographic Information System (GIS) based on android for ASEAN Tourism is mobile based GIS application with integrating GPS (Global Positioning System) at the mobile within internet access. There are already several mobile-based GIS applications, but generally they are related with the college location and public facilities such as ATM. Each mobile-based GIS applications are also dedicated to represent GIS in specific areas. The integrated GIS-based mobile application for searching necessary tourism location as part of GIS are not currently available, especially for ASEAN countries which has many tourist attractions, both natural attractions, agrotourism, culinary tours, even cultural and religious tourism. This research aims to create GIS applications for ASEAN tourism based on Android OS using Google Maps API V2 which integrates GPS on the mobile and internet access. This application is expected to help the users in searching the nearest tourist attractions with the user's position. This application is also able to filter tourist attractions by type of tourism locations respectively. Nearby tourist locations are displayed based radius system. This application innovation lies in the use of Google Maps API V2 as basic resource maps in creating GIS map for ASEAN Tourism GIS Application.

Keywords: GIS Applications, Based on Mobile, Android, Tourism.

1. INTRODUCTION

Tourism sector as an economic activity has become a mainstay of potential and development priority for some countries, especially for ASEAN’s countries which have a potential wide area with quite large tourist attraction, the amount of natural beauty, diverse heritage of cultural history, and the lives of the people (ethnic).

Tourism in ASEAN is one of the major economic activities that have a bright prospect. ASEAN consist of ten countries. They are Indonesia, Malaysia, Singapore, Brunei, Thailand, Philippines, Vietnam, Laos, Cambodia and Myanmar. The potency of tourism in ASEAN’S country include natural attractions, agrotourism, spectacular building, culinary tours, even cultural and religious tourism.

Every country has their unique respective tourist attraction, for example Indonesia with their Raja Ampat ocean, Malaysia with Petronas Tower, Thailand with their Wat Arun Temple and the other. This unique respective tourist attraction of ASEAN’s countries have a large opportunities prospective to be developed into a tourism industry that can be known and recognized by world citizen easily.
The establishment of the single market called ASEAN Economy Community (AEC) be in effect at 31 December 2015. It Means, free trading between the Southeast Asia countries (ASEAN) will be going on. One of the purpose this AEC’s existence is for stabilizing or creating prevalent economy in some sectors such as commodities, services, investment, and skilled workforces. But, the prevalent economy at ASEAN haven’t occurred yet, especially in services sector like tourism services. According to ASEAN Tourism Statistics Database (Table 1), the spread of tourist arrivals in ASEAN isn’t equal between the countries.

That condition happen because not all of the tourist attractions in the ASEAN’s countries known by the public and tourists.

Geographic Information System (GIS) technology is a technology of the geographic highly developed, GIS has a good ability to visualize spatial data following attributes, modify shapes, colors, sizes and symbols that are combined to be able to access information related to the geographical location of the region, for example, road information and location of a tourist spot. Some of the information required by various parties, such as business people, tourists, and the general public to be used according to their respective needs. Therefore, the authors intend to create a smartphone application that contains tourist information in ASEAN’s countries, so beneficial for society, especially for ASEAN’s countries and tourists. To support the creation of applications in smartphones then the required supporting data from Google Maps, the Google Maps Api that play a role in providing online map and is open source.

2. RESEARCH METHODOLOGY

Location of this research is all of ASEAN countries located between $14^0\text{LU} - 11^0\text{LS}$ and $92^0\text{BT} - 141^0\text{BT}$. The method of application illustrated by the diagram below:

2.1. Data Processing

Processing activities that will be implemented in this research are processing spatial data and non-spatial data, and we do android java programming script that will be implemented as the following flow chart below:
Description of the diagram above is:
1. First, collecting the tourism object data type and its attributes from Tourism and Culture Ministry for every countries.
2. Second, create the data tabulation of tourism type.
3. Third, create the relational of entity diagram (ERD).
   The design of ERD can be illustrated at the following diagram below:
4. Last, we get the non-spatial data.

Description of the diagram above is:
1. First, prepare Google Map as a map will we used for spatial data.
2. Second, generate Map API key for getting API Key from Google Map.
3. Third, confirm API Key to API Access. If the API Key is accepted, it can be used to show the Map API. If doesn’t, back to generate Map API Key.
4. Last, we derived the spatial data.

3. First, combine the spatial data and non-spatial data at java android script using scripting class that means create programming language to combine spatial data and non-spatial data.
2. Second, the result of scripting class is java android script that be used at PC Emulator.
3. Third, run program at PC Emulator. If the program can run at PC Emulator, application package has been made successfully. If not, scripting class must be cheked and edited again until the program can run at PC Emulator.
4. Last, we get the android-based GIS application for tourism object.

3. RESULTS AND DISCUSSIONS

   The result of our research isn’t in application form yet, but just in prototype form.

3.1. Interface

   a. Home interface design

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4. Last, we get the android-based GIS application for tourism object.

Figure 2.5 Diagram of Java Android Script Programming
At figure 3.1, sub-menu that be showed are:
1. Menu, and
2. Exit
b. Menu interface design
   If we choose “Menu” button, it will be showed following the picture below:

At figure 3.2, sub-menu that be showed are:
1. Geograph info
2. Tourism Object
3. About Us, and
4. How to Use
c. Tourism Object interface design
3.2. Feature

d. Top Filtering Option
   o An online comparison finds exactly what users looking for, no matter when you travel, where you travel.
   o Search by location – it we will show users the best choices tourist attractions in ASEAN.
   o Filter by POI and attractions – it will find the best location in proximity to what users want to see.

e. Top Clarity:
   o The SENTRA App has an accurate geo location based on Google Maps API V2.
   o An integrated map function takes users directly to tourist location, no matter where users are travelling from.
   o Interface: easy experience.

4. CONCLUSIONS

1. GIS application for tourism object can be designed and developed with Java language programming.
2. Mobile application can give many information about tourist location and radius from the current user location to tourism object location that user will be visited.
3. Mobile phone application can display many tourism object such as Nature, Culinary, Culture, and Religious tourism object.
4. Radius information at this application is the radius of nearest route based on radius calculating method by Google Map.
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It is a great opportunity for us to do this research about “Sentras (ASEAN Tourist Attractions) : GIS Application for Optimizing Asean Tourism Using Google Maps Api V2 Based On Android Operating System”. We are actually focusing on those topics which are important for us to know how we can create a prevalent economy for every ASEAN’s countries from tourist services.

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REFERENCES