C2_03_ASL_draft

by Pranowo Pranowo

Mobile Application Development For Smart Tourist Guide

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The development of internet technologies and smartphones have changed the behavior of people in everyday life interact with one another. Society is becoming more easily in requesting and obtaining information through mobile devices. Surakarta is an autonomous region with the status of a town under the Central Java province that has many interesting attractions area for foreign tourists as well as locals. By 2015 the number of tourists visiting the city of Surakarta as much as 4.2 million people. Some tourists still difficulty in getting information on the location of tourist attractions in the city of Surakarta. This research is used to help travelers in monetizing location information tours in the city of Surakarta. This research method using KNN algorithm, K-means and collaborative filtering. Distance between data user's needs with a purpose will be collected in a category with KNN algorithm and data will be grouped based on the cluster with the nearest mean. Then choose the nearest one and filter options and recommend options are left with major users. The results of the research were obtained that travelers easy and quick in getting the location information in the tourist city of Surakarta. So taste our satisfaction to travelers and may increase the number of tourists visiting the city of Surakarta.
Keywords: Smartphone, Tourist, KNN, K-mean, Collaborative filtering

1. Introduction

The revolution information and communication technology occurred during the last few years. That changes affect people's daily behavior in interacting with others.[1] The new service began arise because of the advancement of e-technology. The company takes new trends regarding information in which people do not need move to get the information. Even the government began to create services that use the Internet to provide information to the public.[2]

This service began to change based on mobile, where users can request and obtain information and services through mobile devices.[3] In the tourism industry, information technology has also been

developed for the travel and tourism sector.[4] The tourism sector is able to produce about 11% of gross domestic product and employs 200 million people and serving tourists 700 million people worldwide.[5]

Surakarta is an autonomous region with the city status under the Central Java province has many tourist attractions. Every year, foreign tourists and local tourists who come to the city of Surakarta increasing. By 2015 the number of tourists who visit the city of Surakarta is 4.2 million.[6] They were on vacation visiting tourist attractions that were there or just hunt culinary regional specialties.

Little information about tourist sites in Surakarta causing trouble for travelers to find the tourist sites. Travelers have to read the directions or ask the locals. In addition there is also a hire a tour guide to get information about tourist sites in the city of Surakarta.

The purpose of this paper is to help tourists obtain location information of tourist attractions in Surakarta on time when they move. Results are expected to add a sense of satisfaction and comfort of the travelers to travel in Surakarta. So as to increase the number of tourists who traveled to the city of Surakarta.

2. Literature Review

Tour guide application design using augmented reality (AR) has been done to assist travelers in guiding their travel.[7,8] In addition, studies how the tour guide can provide information query for the hotel, restaurant and museum.[9] Using the mash-up technology, the application can solve the problem of tourist guides to help travelers get travel location information anytime and anywhere.[3,5]

The development of the multiplatform mobile travel guides are also made to offer services to travelers.[10] By using three layers of web service architecture, tour guide system can provide tourist information to travelers with comfortable.[11,12] From there, the literature review proposed research that aims to design applications that tour guides can help tourists get information tourist sites in the city of Surakarta in a timely manner.

3. Design

The analysis stage is an important step before the system is made. Often the system made no liking for less than the maximum in analyzing needs. Stages Analysis aims to make the system made in accordance with the expected. So that errors in the manufacturing system can be minimized. Needs analysis can be done by conducting interviews to stakeholders and field studies to obtain information about the system being designed.

Tourism system in Surakarta travelers generally know the detail information about tourist attractions or culinary tourists usually ask the locals or hire a tour guide. Guides show and tell about travel locations ranging from historical sites, tourist attractions as well as detail the advantages and disadvantages of these sights. To find out the location of tourist attractions and culinary places, tourists also saw a brochure or flyer. While the information shown in the brochure or flyer less detail. So that tourists can not get tourist information in Surakarta timely as they move.

In this study, the proposed system is that tourists do not require the local tour guide to find out information on places of tourist attractions in the city of Surakarta. Travelers can obtain tourist

information in Surakarta from their smartphone through application Tourist Guide.

Methods of data collection using interviews and field studies. Interviews were conducted to the sites to obtain tourist information. In addition, it also uses resources from other research that already exists, for example journals, papers and books. This study uses KNN algorithm, the K-means and collaborative filtering.

Algorithm K-Nearest Neighbor (KNN) is a method to classify the object based on the learning data that were located closest to the object. The working principle of the K-Nearest Neighbor (KNN) is looking for the shortest distance between the data to be evaluated by K neighbors closest in the training data.

$$d_i = \sum_{i=1}^{p} (x_{2i} \quad x_{1i})^2$$

K-means algorithm is one algorithm with partitional, because K-means based on the determination of the amount of the initial group to define the centroid value initially. K-means algorithm using the process repeatedly to obtain the database cluster. K-means algorithm will classify the data items in a dataset to a cluster based on the shortest distance.[13]

Collaborative filtering is a filtering process or evaluate an item using the opinions of others. Filtering is done by using a profile. Collaborative filtering techniques to collect and build a profile, and define the relationship between the data in accordance with the model in common. Collaborative filtering aims to filter user selection and then recommend the choice is left to the user.[14]

Fig. 1 show architecture tourist guide where user interaction to the system via a smartphone to access the application using the GPS tour guide. Then the system will be processing the orders given by delivering the desired location Based on longitude and latitude. In addition the system also automatically read through the information database which has been built and displayed based on each option has been specified. The options displayed include tourist attractions, culinary, lodging and markets, as show in Fig. 2.

4. Result and Discussion

The system uses three modules tourist guide in the implementation. The first module is used for the authentication of the system, the second module is used to provide a recommendation as desired user and the third module is used to notify users via google map.

In the first module used the checking system. Users already registered or not. If you have not registered, users can register in the system at that time. Once entered, the user will get the authentication of the system then the user can access the system.

While the second module system will recommend places such as tourist attractions, culinary, hotel and market according to the location selected by the user. Collaborative filtering is used to filter between the primary and the user's choice of the users. Furthermore, after filtering, the system will recommend the place to the user.

In the third module is used to provide notification to the user with the help of google map. For example users are in certain positions and with the help of GPS, the coordinates of the user's location

can be determined. Then the system will notify all nearby tourist locations or other places such as places to eat, hotel or market.

Information displayed includes the application of tourist guide :

1. Tourist attraction
   a. Natural Tourism
   b. Culture Tourism
   c. History Torurism
2. Culinary
   a. Traditional Culinary
   b. Modern Culinary
3. Hotel
4. Market
   a. Tradiosional Market
   b. Modern Market

5. Conclusion

In this paper, we present a design for a tour guide system. Travelers can get information on tourist sites in the city of Surakarta in a timely manner when they move. In addition, tourists can find out other information such as culinary, hotel and market.

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Figure captions

Figure 1. Architecture tourist guide.

Figure 2. Architectural design of tourist guide.
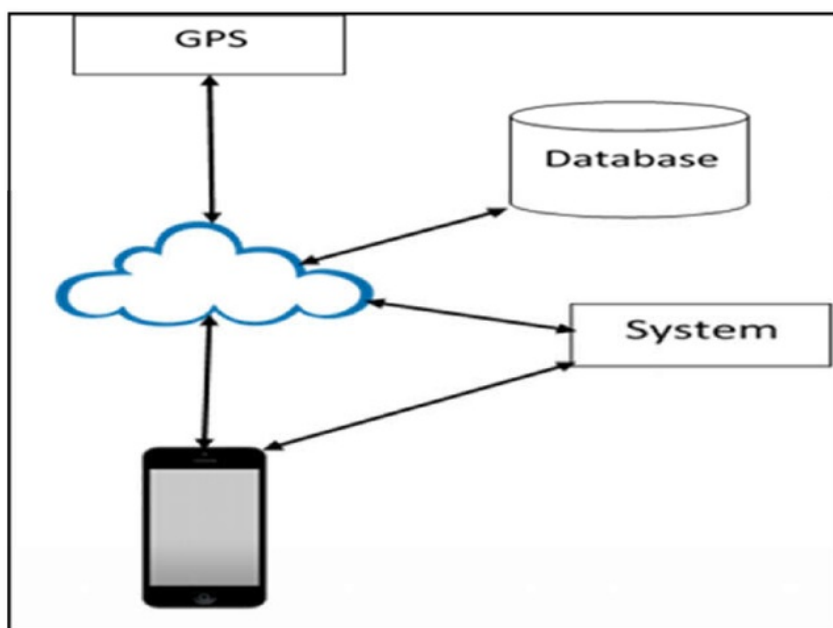
Figure 1. Nugraha et al

Figure 2. Nugraha et al

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FINAL GRADE

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GENERAL COMMENTS

Instructor

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