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NYAM: An Android Based Application for Food Finding Using GPS

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Abstract

The purpose of this research is to build an android based application to make easy to find the nearest restaurants where a user can see restaurant profiles, comments, like, amenities rating, hygiene, and services and as well as a media campaign for the restaurants. The method used is by questionnaires, interviews, observation, and literature study. The result of this research is NYAM app that can search for food based on GPS, categories, and types and this app can facilitate the search for suitable eating place where user can see restaurant profiles, comments, like, and amenities rating, hygiene, and service, as well as restaurant owners, can promote a place to eat in this application. Most of the respondents find out that the application was easy to use (94.10%), and features were easy to understand (89.1%). The majority of the respondents (84.10%) will continue to use the NYAM system because they find the NYAM system was helping them to find the best restaurant to have their meals with a decent price and have good tastes (88.40%).

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1. Background

Technology has been evolved in many aspects and has been significantly influenced the way how we as humans live. It also has changed the way how we work and collaborate with someone else as well as has transformed the

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way how we inquiry information in the world. Nowadays, it has never been easier to search for information about something we want to know such as looking where we can have a haircut on Sunday evening or which intersect to take to avoid the traffic.

Food has been the center of our life. People are looking for food for several purposes. They are going for a food when they are hungry as well as they are going for food because they want to explore the local culinary taste. Nowadays, the information provided by the WWW has been significantly helped people to search the information about local food. However, most of the information showed in the WWW are only returning the generic information queried by most of a typical person (i.e. a majority). Hence, the information provided by the WWW is not sufficient enough to cope a specific query regarding, for example, the price (e.g. searching for a budget culinary place, specialty in the area for supper, etc.).

There are several research that has been developed in order to make the application about food searching in mobile. Ramojhan et. al. developed a mobile-based application which called “Food Feast” for ordering the food via mobile phone. With this application, the customer can create an account for ordering the food. In general, the Food Feast application has 4 features: Login, Item Display, Order Tracking and Feedback features. This application successfully helps the customer in ordering the food easily and also provides the information needed by the customer. Another research comes from Adithya, Singh, and Pathan. They proposed an online food ordering system in order to help customer can order and easily track their food. This application successfully helps the customer in ordering the food, tracking the order, and rate the food items easily. Besides, the restaurants can customize the menu and upload images easily. Having the menu in online enabling the restaurant to attract the new potential customers.

This paper proposes a location-based service for searching food in mobile. Research on location-based information mostly is still in the infancy stage as location-based information is highly depending on the local data. Crowdsourcing information would be the best solution to this problem. With the information provided by the local people, we could benefit a specific information that only known by the local people (e.g. the best place to eat, the best price for dinner, specialty in the area, etc.).

This paper contributes to the exploration of location-based services for searching local food in mobile. To narrow down the scope, this paper proposes a location-based service for searching food with Android in Indonesian. This could benefit food lovers in Indonesia as Indonesia has rich culture and type of foods than any other countries. As most of the literature suggested, most of Indonesian have Android as their mobile operating system. In 2018, Android market share in Indonesia reached almost 50% (45.5%) of the population of mobile users in Indonesia. The number has been growing since 2014, where it only had 32.6% of market share and to be predicted to reach 47.6% in 2019.

2. Recent Work

There as several works have been done in this area. Most of the contribution made in this area were implementing or using GPS system on the phone, as a mobile phone will be always with the user. However, a GPS system has several disadvantages towards the system that is using it. The majority problem occurred with such system is usually the accuracy of the location. Researches in the area of food recommendation based on the user’s location are mostly using the mobile phone as the interface to users and mobile phone as well as computer (some of them are using web system or services). With a GPS system, there are a number of research can be done by using the user’s recommendation and habits with their eating. The system will be able to pick up a pattern in their eating habit, thus the system will be able to provide some recommendation regarding their eating places, what they eat, with whom they eat, etc. The system will also be able to pick up the local search, thus will recommend a local restaurant where user now based on their similarity search.

Moreover, some matured system or applications in food recommendation using location-based have existed. The first application is, Qraved. Qraved is a platform that provides solutions to answer "eat what" and "eat where". This application uses GPS to find a nearby restaurant. However, this application has some drawbacks, which are inconsistent in the use of language between Indonesian and English. Unfortunately, there are only ten dining place option available (Kemang, Kelapa Gading, Senopati, SCBD, Central Bogor, Sudirman, Kuningan, PIK, North Serpong, Tamrin) with medium to high-class economy society consumers. Each restaurant has its own rating in
which the rating is rated by the users. The second application or system is Zomato. Zomato is a feeding app that has a mission to make sure no respondent experiences a bad meal again. This Android-based app uses Global Positioning System in its search features. Use English as well as the Indonesian language in the application. Zomato in its search feature displays restaurants with 1 km distance with an upper middle target. Zomato does not have a promo feature that shows where any restaurant is currently running a promo. Medium to lower targets. No promo menu. Language is inconsistent between Indonesian and English. Each restaurant has its own rating in which the rating is rated by the users. Both systems were compared with our system in Section 4.

3. Proposed Method

The research is divided into three phases, the first one was requirement analysis, where literature review and the initial study was performed. Next step was to design the system based on the synthesis drawn from the literature review and initial study. Finally, the last stage was the evaluation of the system proposed. This research is designed as a pilot study serves to test the water of research in this field. Further developments of the system and research are described in the last section.

The first stage, the initial study was performed by surveying seventy-two respondents (51.50% Female) who are mostly (90.9%) students in a higher education system. In the survey, the majority (66.67%) of the respondents feel that it is quite challenging to search a good eating place with a decent price. Most of them (84.8%) are usually having their meals in the university food court. All of them usually ask their friend to recommend them for an eating place and sometimes (63.60% of the respondents) and the most favorite food is Chinese food (90.9%).

In the second stage, the system prototype was developed. Fig. 1 illustrates the proposed system architecture for NYAM system. The system required a connection to GPS; hence, a smartphone (Android in particular) with GPS is required to use the system. The smartphone sent a request to a GPS satellite and the satellite sent coordinate data to the smartphone to be further processed in the system. All the processed information are stored in a cloud database; hence an internet connection is also required to retrieve and store or upload the data to the database on the cloud. When a user (either the one who is searching foods/places to eat or the one who owns food places/restaurants) opens the NYAM system through their mobile phone, the mobile phone’s GPS features will be used to locate their coordinate using GPS connection through the GPS satellite. Moreover, the data (e.g. longitude, latitude, name of places, ratings, etc) will be stored in the cloud database, with the user’s consent, be accessed and further analyzed. The cloud database also stores all the data related to the food and its place. Data such as ongoing promo, food category, places, food type are all stored on the cloud database, with the user’s consent.

Fig. 2 presents details features offered in the NYAM system. There are two actors who can use the system, the User (the one who is searching for foods or places to eat) and the Restaurant (the one who owns a restaurant or places to eat). Both actors can access login, register and change profile features. In addition, the User is able to search restaurant by map, category, and food type; display the restaurant information, reviews, rating, comments, and like; give ratings, comments, likes, or reports to a particular restaurant; display, add, and change menu; display
all the promo that they own/received; take or redeem the promo; display and use or redeem the promo in purse. While, the Restaurant can display and create the promo for their restaurant; verify menus that are inputted by the User; display the menu verified; finally, display, add, change, and delete menus of the restaurant.

In the third stage, the system was evaluated by using a questionnaire in the final phase. A total of seventeen respondents that mostly are 21-25 years old (94.1%) and most are university students (76.5%) were randomly recruited to evaluate the system. The detailed results are described thoroughly in the next section.

4. Result and Discussion

As mentioned in the previous section, the purpose of this research is to create a GPS-based mobile application that can be used to search for the nearby restaurant. After user login, NYAM will show nearby restaurant available. In Fig. 3 first screenshot, there are two marks. Red is the restaurant, Blue is the user. There are two roles who can use the application, User, and Restaurant. For User, there are several primary features: finding a restaurant, show the newest promo and give a rating. For Restaurant, the key features are shown promo, create a promo, and change menu data (See Fig. 2). In the User View, the user is required to register first and then login into the system using the credentials registered before. After the login is succeeds, the User will see the navigation that shows the position of User and Restaurants. On the top left, there is a navigation button to direct user on some menu (see Fig. 3), including Dekat Saya (Restaurant Nearby), Cari Restoran (Find Restaurant), Promo (Promotion), Dompet (My Wallet), and Ubah Profil (Change Profile). The Promo menu used to show ongoing promo. Dompet menu used to display promo that has been taken by the user.

Furthermore, the restaurant owner, they can register as a restaurant owner. After registration, they will be able to login into the system as Restaurant Owner. After login succeeds, the Restaurant will see the navigation to insert Restaurant location on the map. If Restaurant location has been determined, then fill the Restaurant data. To add promo, the Restaurant can press the + button on Restaurant Promo page and insert the detail information about the promo. Either User or Restaurant can change their data like name, address, email, phone number. After the user has
been confirmed the change data, the application automatically will change the data to MySQL database with SQL command. All the data will be stored in the cloud system database.

![NYAM (After Login, Navigation, Promo, and Dompet Menu)](image)

**Fig 3. NYAM (After Login, Navigation, Promo, and Dompet Menu)**

The system then evaluated in two methods: self-assessment and user questionnaire. In self-assessment method, the NYAM system was compared with existing professional application. Qraved and Zomato were chosen as the comparison as those applications are the best application for searching places to eat with GPS. Those two applications have been existed for ages and their features are known to be the best among all the similar application. Table 1 describes the comparison of those applications with our system. From the assessment, NYAM system advanced in four aspects compare to those two applications: language consistency, promotion, rating, and features where the user can add menu. Finally, in the self-assessment evaluation, the NYAM system is considered to comply with the best practices to design a user interface with eight Golden Rules and Five Measurable Human Factor. Those assessment or evaluation claims were also supported by the users’ questionnaire describes in the next paragraph.

**Table 1. Application Comparison between Qraved, Zomato, and NYAM**

<table>
<thead>
<tr>
<th>Features</th>
<th>Qraved</th>
<th>Zomato</th>
<th>NYAM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Platform</strong></td>
<td>Android</td>
<td>Android</td>
<td>Android</td>
</tr>
<tr>
<td><strong>Using GPS</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Language Consistency</strong></td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Promotion</strong></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Rating</strong></td>
<td>Not details</td>
<td>Not details</td>
<td>Details (amenities, hygiene, service)</td>
</tr>
<tr>
<td><strong>Report</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>User Can Add Menu</strong></td>
<td>No</td>
<td>No</td>
<td>Yes (get restaurant verification status)</td>
</tr>
</tbody>
</table>

Furthermore, to evaluate the user satisfaction, this study has conducted the survey using a questionnaire, where the respondents were chosen randomly. Fig. 4 illustrates the item or questions in the questionnaire. The main purpose of the survey was to evaluate the system performances and the user experiences while using the system. Based on the questionnaire result, from the total of thirty-two respondents (65.63% aged between 21-25 and 71.88% of them are university students). All of respondents have used either Qraved or Zomato application, so the respondents are familiar with location-based application to search food or restaurant with a smartphone. More than half of the respondents (87.50%) feel the system was very helpful in helping them to order food with the mobile application. This was because the respondents (98.2%) find out that it was really easy to use the application and system, the message (error, promo, etc.) was quite understandable (59.38%). Furthermore, all the features were quite
easy to access (90.63%) and the language provides in this application (Indonesian language) is very easy to understand by the users. This resulted, as many as 82.35% of the respondents will use the application for the future.

5. Conclusion and Future Work

This paper presents an exploration of location-based services for searching food using Android mobile phone in Indonesia which is called NYAM application. Based on the evaluation conducted, it is shown that NYAM application can be an alternative solution for the people who want to search the food near their location. It can be concluded that this local-based service application can facilitate the user for ordering food based on the user’s preference, where the user can find the nearest restaurant, view the profile restaurant, gives comments, and view the ongoing promos offered by the restaurant owner. From the evaluation, most of the respondents find out that the application was easy to use (94.10%), and features were easy to understand (89.1%). Moreover, most of the respondents (88.20%) agreed that the language in the application was easy to understand. Finally, the majority of the respondents (84.10%) will continue to use the NYAM system because they find the NYAM system was helping them to find the best restaurant to have their meals with a decent price and have good tastes (88.40%). For the future work, there are several improvements that can be added to this application, such as user can earn points after gives the comments, ratings, and likes, where the points can be exchanged for a certain restaurant’s menu. In addition, the users can also add the location for the restaurant by themselves. Moreover, there is a possibility to integrate this system with a virtual human/assistant system\textsuperscript{12,14,15}. The virtual human/assistant or chatbot system will be able to recommend the user who is searching for a place to eat with an Embodied Conversation Agent\textsuperscript{13} and naturally interact (verbally and non-verbally) with the user.
References