

GEOLOCATION-BASED PEDDLERS SALES SYSTEM IMPLEMENTATION

Ahmad Mukhlis Saputra¹, Eko Budi Setiawan²

^{1,2}*Informatic Engineering – Indonesian Computer University*

Jl. Dipatiukur No.112-116, Lebakgede, Coblong, Kota Bandung, Jawa Barat 40132

E-mail: ahmad_mukhlish_s@yahoo.co.id¹, eko@email.unikom.ac.id²

ABSTRACT

Abstract - In this information age, peddlers are still not able to take advantage of technological developments for their good in the business sales system. The missing transaction case when peddlers unknowingly passed by, the unaccommodated pre-orders where the buyer requires several foods on a specific date, and the lack of a way to find out the optimal route for trading around are handful problems for the buyer as well as the peddlers. There is also a specific phenomenon where peddlers business owners have developed their businesses, so they have more than one peddler. The more complex management process and the difficulty in determining the number of ingredients that they must purchase per day becomes a problem that must be handled by the owner. The research method used is the waterfall method starting from the problem identification stage to drawing conclusions and suggestions. Research supporting data obtained from the results of online and offline questionnaire interviews, observations, and literature studies. An alternative solution offered is to build a geolocation-based peddlers sales system that can synchronize peddlers and buyers as well as assist the owner in the management of the peddlers business. The results showed that the system built was able to synchronize peddlers and buyers and was able to assist management for the owners. The interview results show that 87,53% approval rate of ease of finding and knowing the presence of traveling merchants in the usual ordering process, 85.3% approval rate accommodating pre-order bookings, 81.25% route optimization and how to handle orders, 90% ease of owner management processes, 70% recommend the amount of food that must be purchased and made into food and 78% the overall usability level of the system

Keywords: peddlers, geolocation, synchronization, management, recommendation.

1. INTRODUCTION

In this information technology era, peddlers are still not able to take advantage of technological developments for their good in business sales system to the fullest. It is miserable since according to Muhammad and Auliya [1] the phenomenon of peddlers in Indonesia is a site that has the potential to grow microeconomic stability through the informal sectors. When put to good use, the use of information technology, especially web and mobile technology, can solve various problems that are often faced by peddlers.

This study is focusing on the problems of buyers, peddlers, and peddlers business owners. Buyer has not been able to find out the existence of peddlers so that missing transactions are often occurring. The buyer has also not been able to buy on a pre-order basis at predetermined dates. On the other hand, peddlers find difficulty in obtaining optimum trade routes for strategic trading area location. In fact, according to Mira and Ijal [2], the strategic trading location is one of the critical variables for increasing income from the peddler business. There is also a phenomenon where peddlers business owners have developed their businesses and have more than one peddler. The more complex management process and the difficulty in determining the number of ingredients that must be purchased per day becomes a problem that must be handled by the peddlers business owner.

There are several studies that have addressed the problem of peddlers, along with the use of Google Maps for the Geolocation process. From the research written by Wahyu [3], the application made is to obtain peddlers information and provide notifications to buyers when peddlers approach the buyer's location. There are also chat features that facilitate interaction between peddlers and buyers. In research conducted by Eko [4], Google Maps is used to show the mapping of the potential of creative industry businesses.

As stated by Intan et al. [5], smartphones have become a lifestyle in people's lives. In this study, peddlers and buyers will use Android-based

application. Currently, almost everyone uses various types of smartphones, especially Android. The results of the questionnaire given to 70 respondents inform that 100% were smartphone users, and 92.9% used Android smartphones. For the management section of the owner, the owners will use a website that has various facilities for management process along with various advantages of website media such as larger screens for operation on computers and many more.

The existence of push notification as done in the research of Ramos and Monika [6] can be a solution to provide information to each other in real-time without always having to open the application. Notification will provide information about the existence and location of peddlers for prospective buyers. Also, the system will provide a pre-order feature that can accommodate the needs of buyers to purchase on a specific date. The system through the Android application will provide recommendations on the best area route order based on sales history. Besides, a website is provided for owners to accommodate more complex businesses. This site will provide recommendations for the number of ingredients that must be purchased each day based on sales history.

2. LITERATURE REVIEW

On this literature review section, several technology implementations are explained. The technology implementations to be discussed includes the Google Maps API, OpenWeatherMap API, MySQL Database, Firebase, and Push Notification.

2.1 Google Maps API

Google Maps Android is a software development kit (SDK) that is capable of making android able to load Google Maps map pages. One of the features provided allows developers to be able to add maps to the application based on data in the Google Maps API through the stages of access to the Google Maps server, downloading data, displaying maps, and updating map movements. In this research, there are 4 Google Maps APIs used, namely Google Maps for Android, Google Maps JavaScript, Google Maps Direction API, and Google Maps Distance Matrix.

2.2 OpenWeatherMap API

OpenWeatherMap is an online service that provides data about weather, including current weather, weather forecasts, and weather history for web and mobile developers.

2.3 MySQL Database

MySQL is a multithread, multi-user, multi-user SQL database management system or database with around 6 million installations worldwide.

2.4 Firebase

Firebase is a product from Google that can provide data in real-time. FCM is a Firebase Messaging Service provides a variety of real-time messaging services, one of which is pushing notification.

2.5 Push Notification

Notifications are short-term information about events in the application when the application is not used. Push Notification is a form of network communication, i.e., the server will send a notification message to the client if there is a change in data, so that the client does not need to process the data request every period to retrieve the notification data.

3. RESEARCH METHOD

The research method applied in this study is the waterfall method. The waterfall method is a systematic and sequential information system development model [7]. The Waterfall method has the following stages [8]:

1. Requirements analysis and definition

System services, constraints, and goals are determined by the results of consultations with users who are then defined in detail and function as system specifications [9].

2. System and software design

System design stages allocate system requirements, both hardware and software by forming the overall system architecture. Software design involves identifying and abstracting the software's essential systems and their relationships.

3. Implementation and unit testing

At this stage, software design is realized as a series of programs or program units. Testing involves verifying that each unit meets its specifications.

4. Integration and system testing

The individual units of the program or program are combined and tested as a complete system to ascertain whether it matches the software requirements or not. After testing, the software can be sent to the customer.

5. Operation and maintenance

Usually (although not always), this stage is the longest stage. The system is actually installed and used. Maintenance involves correcting errors that were not found in the previous stages, increasing the implementation of the system unit, and improving system services as new needs.

4. SYSTEM ANALYSIS

This system analysis section will explain the analysis that has been carried out regarding system development which includes: business rules analysis, system architecture analysis and use case diagram analysis.

4.1 Business Rules Analysis

1.Owner

- a. The owner can manage the peddlers business at the system after registering as an owner.
- b. The owner can manage the owner's data (profile data).
- c. The owner can register the peddlers that he has.

- d. The owner can have more than one peddler.
- e. The owner can view, add, edit, and delete the peddler's data.
- f. The owner can enter data on food sold by the peddlers.
- g. The owner can view, add, edit, and delete food data.
- h. The owner can enter ingredients lists for making the foods along with the grams and the price of each ingredient.
- i. The owner can view, add, edit, and delete ingredients data.
- j. The owner can monitor the location and status of peddlers on a digital map interface.
- k. The owner gets a recommendation for the number of ingredients to be purchased tomorrow and the amount of food to be made based on transaction sales results, pre-orders, and weather forecasts tomorrow.
- l. The owner can see the sales report for each peddler's sales history.

2. Peddlers

- a. Peddlers can see a list of orders made by buyers who order today and pre-orders.
- b. Peddlers get notifications whenever a buyer orders both today and pre-orders.
- c. Peddlers can approach a buyer on the order list to finish the order and make transactions when the distance between the buyer is less than 200 meters.
- d. Peddlers can get recommendations for the route area based on yesterday sales results.
- e. Peddlers will receive payment directly from the buyer after the transaction.
- f. Peddlers will get a review from the buyer after finishing the order.
- g. Peddlers will get a notification when they get a subscription.

- h. Peddlers will send notifications when trading around and when the distance to the subscribing buyer is less than 200 meters.
- i. Peddlers can chat with buyers.
- j. Peddlers can only open pre-orders when today's date is the same as the pre-order date.

3. Buyers

- a. Buyers register themselves through registration in the buyer's application.
- b. Buyers can see the current peddlers online and in the same area with them.
- c. Buyers can order one or many orders to selected peddler complete with notes (for example: do not use the spicy sauce).
- d. Buyers cannot make orders when they have placed an order with one peddler until the order is completed or canceled.
- e. Buyers can cancel orders.
- f. Buyers can pay directly to the peddler when the peddler completes the order.
- g. Buyers can chat with the peddler.
- h. Buyers can provide a review to the peddler after the order is complete.
- i. Buyers can subscribe to the peddlers after completing the review.
- j. Buyers can unsubscribe a peddler.
- k. Buyers get notifications when subscribed peddler's distance is fewer than 50 meters.
- l. Buyers can pre-order the peddler by entering a specific date on their order so that they can order even though the peddler is not trading around yet.

4.2 System Architecture Analysis

System Architecture is a blueprint for system to be built. Following is figure 1 that shows the architecture of the peddler sales system to be built:

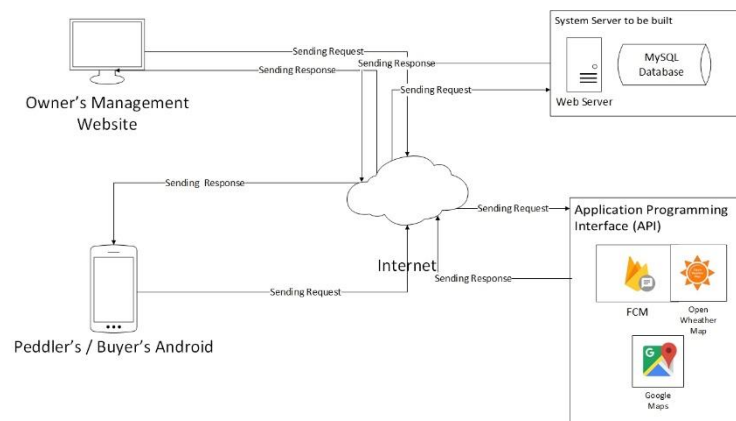


Figure 1. System's Architecture

4.3 Use Case Diagram Analysis

Following is figure 2 that shows the Use Case Diagram of the system built

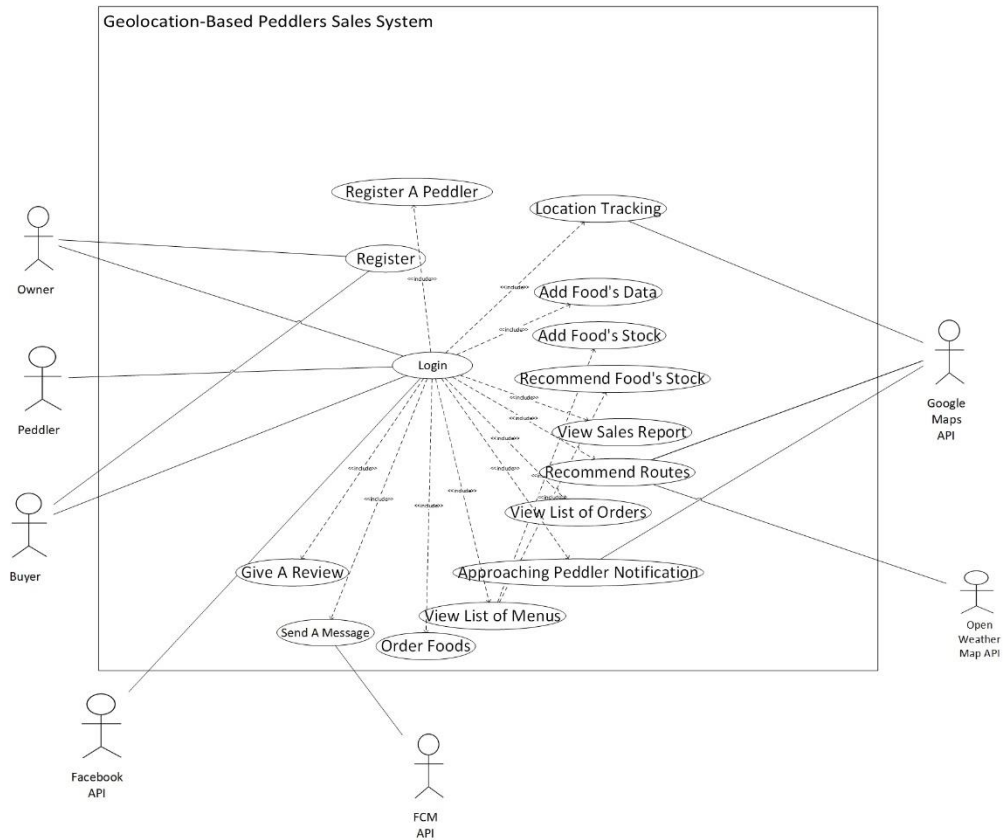


Figure 2. Use Case Diagram of the System

5. SYSTEM DESIGN

In this system design section will explain the analysis that has been done regarding the construction of the system which includes: data design, menu structure design and interface design.

5.1 Data Design

Following is Figure 3 that shows the data design by the Relation Schema:

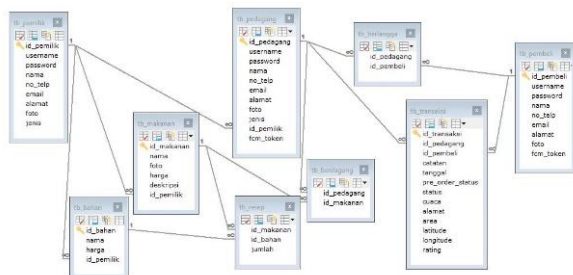


Figure 3. Relation Schema

5.2 Menu Structure Design

Following are Figure 4, 5, and 6 that show the menu structure design for the buyers, peddlers and owners:



Figure 4. Buyer's Menu Structure

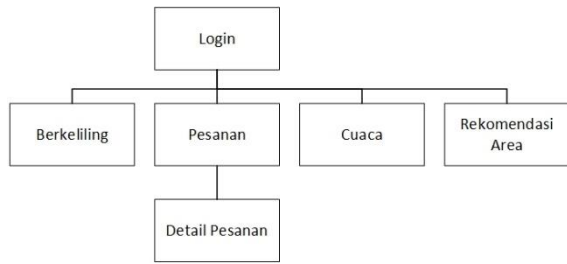


Figure 5. Peddler's Menu Structure

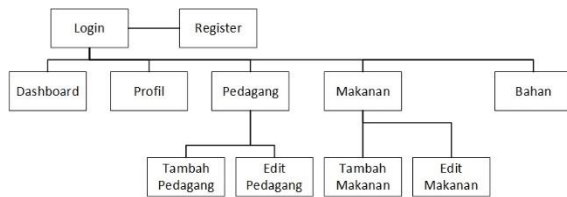


Figure 6. Owner's Menu Structure

5.3 Interface Design

Interface design is divided into 3 sections according to 3 user segments which include buyer interface design, peddler interface design and owner interface design.

1. Buyer's interface design

Following are sample images of the buyer's interface design:

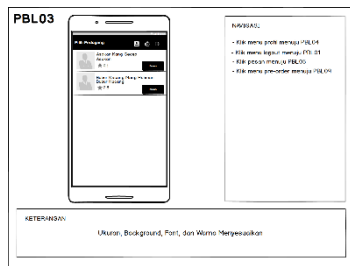


Figure 7. Pilih Pedagang (Select the Peddler) interface design

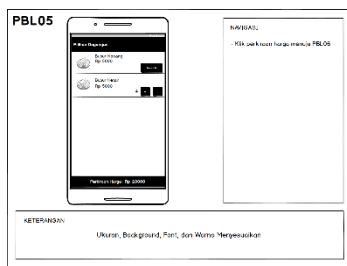


Figure 8. Pilih Makanan (Select foods) interface design

2. Peddler's interface design

Following are sample images of the peddler's interface design:

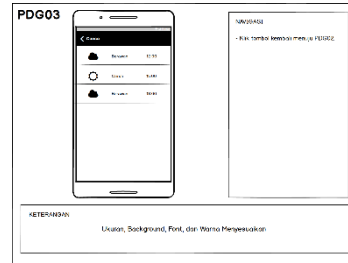


Figure 9. Weather Forecast Interface Design

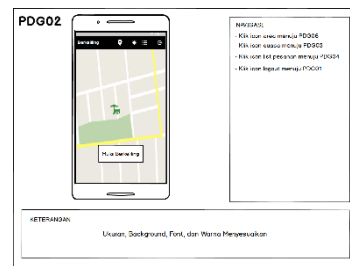


Figure 10. Berdagang (trade around) interface design

3. Owner's interface design

Following is a sample image of the owner's interface design:

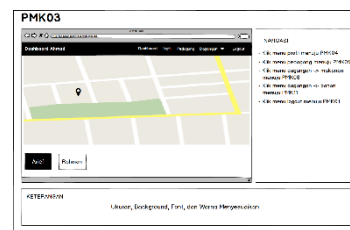


Figure 11. Dashboard interface design

6. CLOSING

Conclusion can be drawn after going through the stages of building Geolocation-Based Peddlers Sales System. In the research that has been done, it can be concluded that the research carried out has succeeded in synchronizing buyers and peddlers in exchanging information and assisting peddlers business owners in the process of managing peddlers sales businesses.

DAFTAR PUSTAKA

- [1] A. I. Muhammad Yunus, "Tata Kelola Pedagang Kaki Lima di Kota Makassar," *JAKPP (Jurnal Analisis Kebijakan & Pelayanan Publik)*, vol. 3, no. 1, pp. 23-26, 2017.
- [2] I. G. Mira Hastin, "Analisis Produktifitas Kewirausahaan Pedagang Bakso Keliling Dalam Meningkatkan Pendapatan Keluarga (Studi Kasus Kecamatan Siulak)," *Jurnal Pendidikan Universitas Jambi*, vol. 17, no. 1, pp. 1 - 8, 2015.
- [3] W. Saputra, "Pembangunan Aplikasi Smart Rekomendasi Pedagang Makanan Keliling Menggunakan Push Notification Dan Location Based Service (LBS) Berbasis Android," *Skripsi Unikom*, 2018.
- [4] E. B. Setiawan, "Sistem Informasi Geografis Untuk Pementaan Potensi Usaha Industri Kreatif," *Core IT*, vol. 1, no. 2, 2016.
- [5] N. N. M. E. R. K. Intan Trivena Maria Daeng, "Penggunaan Smartphone Dalam Menunjang Aktivitas Perkuliahan Oleh Mahasiswa Fispol Unsrat Manado," *Acta Diurna*, vol. 6, no. 1, 2017.
- [6] M. A. Ramos Somya, "Perancangan Aplikasi Push Notification Center Dengan Teknologi Firebase Cloud Messaging Di Pt. Sumber Trijaya Lestari," *SIMETRIS*, vol. 10, no. 1, pp. 211-222, 2019.
- [7] R. Pressman, *Rekayasa Perangkat Lunak : Pendekatan Praktisi (Buku Dua)*, Yogyakarta: Andi, 2002.
- [8] I. Sommerville, *Software Engineering 9th Edition.*, Addison-Wesley, 2011.
- [9] G. W. Sasmito, "Penerapan Metode Waterfall Pada Desain Sistem Informasi Geografis Industri Kabupaten Tegal," *Jurnal Informatika : Jurnal Pengembangan IT (JPIT)*, vol. 2, no. 1, pp. 6-12, 2017.
- [10] A. A. S. A. S. M. L. Hendra Nugraha Lengkong, "Perancangan Penunjuk Rute Pada Kendaraan Pribadi Menggunakan Aplikasi Mobile GIS Berbasis Android Yang Terintegrasi Pada Google Maps," *E-journal Teknik Elektro dan Komputer*, vol. 4, no. 2, pp. 18-25, 2015.