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Development of Android Application for Courier Monitoring System

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Abstract

Accuracy and precision are two important factors which must be fulfilled in distribution of goods, so the business proses lifecycle of an enterprise or company would run properly. However, at the time of the distribution process performed, a problem could occur. A complicated ordering flow can be one of the problem as happened in the distribution of medicine to pharmacies or hospitals. Medicine can be ordered when distributors assign some of its salesman for visiting pharmacies or hospitals and offer medicine to be sold. Pharmacies who will order must create a letter and handed it to the salesman. All orders from some pharmacies or hospitals will be entered into the order book manually by the salesman. Afterwards, order book returned to distributor and after going through several process again, the order will be sent to the pharmacy or hospital. That issue is the topic of this research, which at the time of delivery of order, courier could be negligent. Therefore, courier needs to be monitored to determine whether the order has been shipped or not. The purpose of this research is to design and build a courier monitoring system. Application is an android based application using GPS Location to trace courier location, and Android Cloud to Device Messaging for push notification feature. There are three modules for users of this application. Application in part one will be used by the medicine distributor company. The second one are used by the salesman to make an order while at the customer premises. The last part are used by the courier for order information and customer location. With this courier monitoring system, pharmacies or hospitals could order medicine quickly and in the right amount. This application can also help distributors in order to monitor location of the courier. So that the business process of both parts would run properly.

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1. Introduction

Distribution of goods is one of important process because it involves two parties who run their own respective business processes. Sometimes several problems occur after delivery process. The complex ordering flow is one of the problems, it has also been explored in research conducted by Sari Wijayanti [1] with the topic of drug distribution to pharmacies and hospitals. In this research, will use data of distributors, pharmacies and hospitals only in Surabaya City as a case study.

Problems during drug delivery such as the amount of drug delivered not in accordance with the order, and even negligence such as skipping or not doing the delivery of drugs to one of the pharmacies or hospitals that order. To solve these problems This research will create an Android-based application that can help the ordering of goods. To develop Applications with several functions that can help the process of ordering drugs and courier location monitoring feature that deliver the drug orders. The ordering process of drugs is facilitated by the list of drugs available to the distributors entered into the database server. Thus, the drugs to be ordered can easily be entered into the list of drug orders.

The application will be divided into three parts, the first android-based application used by the salesman to make an order. The second android-based application used by courier to find out the delivery location and the list of drug orders. The third web-based application used by distributors as warehouse officer to monitor the courier location when deliver the orders. When a salesman makes an order, a list of drug orders submit and received by an application on the server, then processed until the list goes to the application used by the courier. The order list will be displayed in the form of a notification message on the Android device that the courier uses. This feature will make it easy for courier to know the order without having to open the application first. To know the location of the courier who is sending the drug, the application is equipped with GPS Location, and the coordinates location will be sent periodically to the Server application.

This application developed on Android platform due to the use of some features like push notification to display order list, and also GPS Location to track the location of courier. This feature cannot run optimally if it is developed with a web based application. In addition, data from eMarketer shows that mobile device usage in Indonesia in 2015 reached 55.4 million users and its penetration will continue to increase until 2019 which is estimated to reach 92 million users [2]. The data shows that the use of mobile devices is increase year by year. The selection of Android platform because of it used much more than another platform like iOS, Windows Phone, and Blackberry. Data from International Data Corporation (IDC) shows that Android has a market share of 78.7% in 2013, and increased in 2014 to 81.5% of other platforms iOS, Windows Phone, Blackberry, and others [3]. Based on that information, it means the most of the mobile devices that people use are running on the Android Platform.

2. Literature review

2.1. Global positioning system (GPS)

Global Positioning System (GPS) is a tool or system that can be used to inform users where the user's location is based on satellite [6]. Data sent from satellite is a radio signal with digital data. GPS positioning is based on distance measurements made to multiple satellites at once. The coordinates of a point on earth can be determined from the results of measurements to the four satellites that can be properly captured.

According to research conducted by Rifqi Andikasani et al [7], GPS positioning is divided into two methods:

- Absolute method or known as point positioning, is the way of positioning by only based on one receiver only. Accuracy of position within a few meters (not in high accuracy) and generally only intended for navigation purposes.
- The relative method known as differential positioning is positioning using more than one receiver. One GPS mounted at a location on earth, and continuously receives signals from satellites within a specified time period and used as references like the others. The position of this method has high accuracy (generally less than one meter) and is applied for geodetic or mapping surveys that require high accuracy.