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Prototype Design of Monitoring Comrade Application (MONITOR KAWAN) during the Work From Home Period

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Abstract

The emergence of the Covid-19 pandemic prompted the Government of the Republic of Indonesia to hold regional community celebration activities to emphasize the deaths of Indonesian citizens due to the Covid-19 virus. Restrictions on community activities require 50% of workers in the essential sector and 100% of non-essential workers to work from home (WFH). Many companies rely solely on daily worker reports sent via email. The place to work during WFH is important to anticipate the transmission of the Covid-19 virus. If employees work more in cafes or public working spaces, the risk of transmitting the Covid-19 virus is higher. This study aims to design an application prototype for WFH employees that can access the website and android called Monitor Kawan. The website-based application is designed for company administrators, while employees and company leaders will use the Android-based application. This application works using the location point of the employee's Android device, which will be stored as an employee travel history.

Keywords: Work From Home, Covid-19, Monitoring, Tracking, Employees Location.

1. INTRODUCTION

The emergence of the Covid-19 pandemic prompted the Government of the Republic of Indonesia to hold regional community celebration activities to emphasize the deaths of Indonesian citizens due to the Covid-19 virus. Restrictions on community activities require 50% of workers in the essential sector and 100% of non-essential workers to work from home (WFH). The concept of WFH in Indonesia aims to prevent the spread of COVID-19, which is currently growing, not because the office provided by the employer is not adequate. However, WFH is not

Edo Yonatan Koentjoro, Mega Pandan Wangi, Pradita Maulidya Effendi, Kristin Lebdaningrum & Dwi Cahyo Putro

fully understood by the employees. they feel many dilemma conditions, such as the mindset that the home is where they rest while work is generally done in the office (Mustajab ed, 2020). This dilemma condition sometimes creates conflicts within the family even though WFH creates flexibility of time and place (Mustajab ed, 2020; McCloskey, D. W., 2018).

During WFH, each business field has its own rules for unifying the work of its employees. However, some companies cannot unify their workplaces during WFH due to limited resources. Many companies rely solely on daily worker reports sent via email. It is possible to communicate using email. Our reliance on email for daily work-related communication has increased exponentially due to the COVID-19 pandemic (PoliteMail, 2020).

The place to work during WFH is important to anticipate the transmission of the Covid-19 virus. If employees work more in cafes or public working spaces, the risk of transmitting the Covid-19 virus is higher. Based on data journal by Fan-Yu Lan, the five occupation groups with the most cases were healthcare workers (HCWs) (22%), drivers and transport workers (18%), services and sales workers (18%), cleaning and domestic workers (9%) and public safety workers (7%) (Lan et. al, 2020).

It can be detrimental if asymptomatic employees transmit the coronavirus to coworkers. Therefore, this study aims to design an application prototype for WFH employees that can be accessed through the android website Monitor Kawan. The website-based application is designed for company administrators, while employees and company leaders will use the Android-based application. This application works using the location point of the employee's Android device, which will be stored as an employee travel history. The employee's location point will be sent to the administrator's website and the leadership application.

2. LITERATURE REVIEW
2.1 History and Background
Ahyar, in a study entitled "Implementation of Smartphone GPS Tracking Technology as a Children's Location Monitoring Application", explains how to help parents monitor their children's daily activities. Researchers created a location monitoring system using an android smartphone by utilizing Global Positioning System (GPS) technology as a tracking device (Muawwal et. al, 2017).

In addition, the research Ahmad, entitled "Utilization of Google Maps API for Searching the Location of the Nearest Gas Station Locations in Jepara & Kudus City with Node-JS Technology", describes a prototype system with node.js technology and the help of the MongoDB database. Researchers create a system that can help the community find the nearest gas station location route (Syafiq et. al, 2016).

Based on the results of previous research, a system with the same method is needed in monitoring employees who do Work from Home (WFH). The GPS method used in this study uses the absolute method. The absolute method is a method of determining GPS positioning. This method is known as point positioning, which determines the position based on only one receiver. (Oseanografi, 2020) In its application, the absolute method is widely used by several researchers in measuring the distance of a GPS. Absolute methods are very commonly used, especially in finding locations. One other researcher named Armenia, entitled "Analysis of Land Field Measurements Using GPS Mapping", explained that one of the methods used in measuring land parcels is the absolute method (Ramadhony et. al, 2017).

3. METHOD
This research was carried out based on 6 stages, as shown in Figure 1. In the problem analysis stage, researchers will take several samples of the location of employees' homes that can be used to implement GPS. The house's criteria are determined based on the range of the house that can be recognized on the GPS.
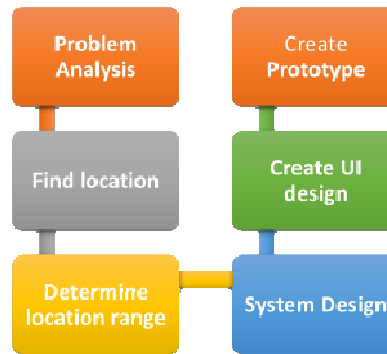
Edo Yonatan Koentjoro, Mega Pandan Wangi, Pradita Maulidya Effendi, Kristin Lebdaningrum & Dwi Cahyo Putro

FIGURE 1: Research Framework.

3.1 Problem Analysis

In the find location stage, the author will use the tools on the website https://www.latlong.net/ to get the Latitude and Longitude positions. In order to get a positioning that matches the GPS location, the absolute method will be used several times. For example, if the employee is in their room, yard, or street in their home area. At the determine location range stage, the distance from the front of the house to the back of the house will be assumed. It aims to get a range of locations when the employee is home. In the system design process, a system design will be made according to the application platform used. This system design is intended to describe the system's workflow and what database design will be formed to build the concept of this system. The UI design stage will explain the wireframe design and mockup to be built. This design will use Balsamiq tools (https://balsamiq.com/) in making wireframes and using Android Studio in designing Mockups. The final stage is to create a prototype to provide a visual description of how the application works, as making this prototype only uses basic features that can later be implemented into the actual application.

3.2 Find Location: Procedure of Location Point Collection

Retrieval of location data is very necessary for determining the location of employees. A point location is the main key in determining the employee's position. There are several criteria as follows:1) Employees are assumed to work alone in their homes or places of residence, 2) Employees do not have relatives or families who work in the same company.

Based on the criteria above, the author surveyed some employee location data at random. The data is required to complete the addresses, latitude points and longitude points. In order to help collect the research data, the authors use 3 (ways), including, 1) Search point locations using Google Maps; 2) Search for location points using the Map Coordinates Application; 3) Search for location points using the Langlong.net website.

These three methods are used as parameters to predict intervals or distances of latitude and longitude points that differ from one application to another. The determination of the different distances is intended to position employees at different distances from the location of their residence. For example, employees on the fence, in the room, and the kitchen may have different coordinates because the building area was not calculated in the preparation of this study. The determination of the interval will be adjusted based on the data obtained.

3.3 Determine Location Range: Data Collections

Employee location point data taken in this study are latitude and longitude data. Latitude and longitude data were collected in 3 ways: Google Maps, the Map Coordinates application, and the Langlong.net website. These three methods are used as parameters to predict intervals or distances of latitude and longitude points that differ from one application to another.

Edo Yonatan Koentjoro, Mega Pandan Wangi, Pradita Maulidya Effendi, Kristin Lebdaningrum & Dwi Cahyo Putro

Sources	Latitude, Longitude
Google Maps	-7.317843417103275, 112.70378508466115
Map Coordinates	S 7°19'02.5752" E 112°42'14.652"
Langlong.net	-7.316880, 112.705520

TABLE 1: Latitude and longitude data.

The determination of the different distances is intended to position employees at different distances from the location of their residence. For example, employees on the fence, in the room, and the kitchen may have different coordinates because the building area was not calculated in the preparation of this study. The determination of the interval will be adjusted based on the data obtained. Table 1 presents one example of location point data taken.

3.4   System Design: Database
In this research, the Monitor Kawan application will involve a database for media storage that can save overall data entry and the actual process. In addition, the database undoubtedly provides several benefits, such as creating, reading, updating, and deleting data that will be connected with the Monitor Kawan application to manage information processing in the future. Therefore, the first step is creating a database design of the important requirements in building a prototype of the Monitor Kawan application as easily implemented. Unfortunately, producing a database design has been hindered several parameters which are unpredictable to use the Monitor Kawan application. The current barrier is employees having two or more smartphones that the Monitor Kawan application only installed in one smartphone to secure its validity. Another reason is when the smartphone can be installed, the Monitor Kawan application, which employees would not bring, go outside, as the location point in the Monitor Kawan only engages in discovering employees position in terms of the smartphone's GPS.

Therefore, this situation has prompted the researchers to confine the study to consider that worker only has one smartphone to operate in daily activity. Moreover, the smartphone has to be a significant device that can communicate with their colleagues in finishing the jobs.

A database design will be created, there are seven tables interconnected with each other tables, and a database will be capable of storing the data from a user who has an account on the Monitor Kawan application. In other words, the integration process will be led among a database and the Monitor Kawan application in the development. Meanwhile, seven tables in a database design are included as the table of employee_level, job_placement, department, manajemen_user, log_monitor, and lokasi_karyawan. Furthermore, a table includes a primary key, an essential unique code to differentiate the tables in a database. Figure 2 presents A database design of the Monitor Kawan application has been illustrated.
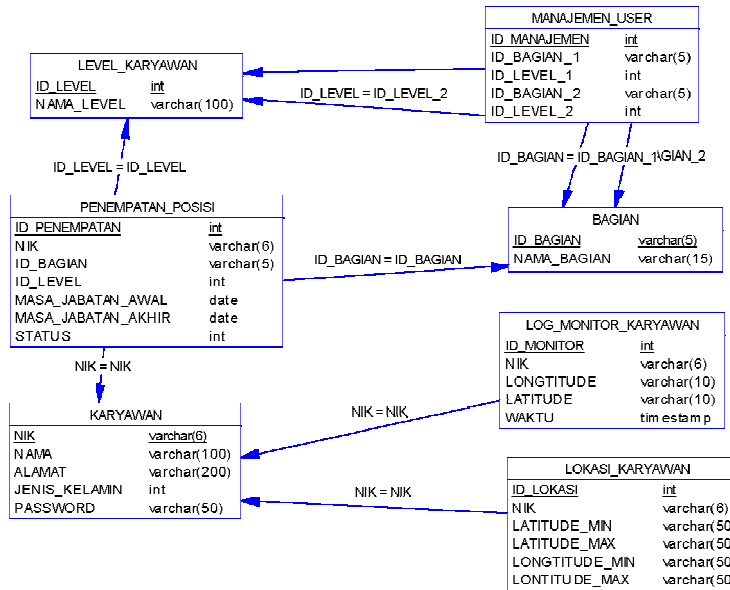
Edo Yonatan Koentjoro, Mega Pandan Wangi, Pradita Maulidya Effendi, Kristin Lebdaningrum & Dwi Cahyo Putro

FIGURE 2: A Database Design of the Monitoring Comrade Application (MONITOR KAWAN).

4. RESULTS

The research interfaces are the wireframe and mockup design that depicts the prototype of the Monitor Kawan application. In addition, the mockup design of the Monitor Kawan application has entailed two versions, website and android versions.

4.1 Create UI Design and Prototype: Mockup Design in Website Version

The mockup design in the website version has represented the prototype website for the Monitor Kawan application, developed for the admin users. Moreover, the mockup design in website design tends to be intuitive and easy to use for the admin user to input, update, delete, and show the data usage of employees, which will be utilized in the Monitor Kawan application. The mockup design in the website version indicates 7 web pages in the form of welcome, login, dashboard, level of employees, department, placement of position, and profile and monitoring pages. In addition, the mockup design in the website version, admin user, illustrates the number of levels of users, departments, and new users in the dashboard web page. Afterwards, the level web page gives information on the user level of employees, and the admin certainly can add and update data user, as well as the department page, shows on adding, updating, and deleting data of department where employees work. Then, the placement of position page presents data, and admin can add new data of user or admin position on this page, and the profile and monitoring page has been provided to input and to update an employee profile, undoubtedly, admin can inspect the positioning status of employees when they work from home. Figure 3 presents the wireframe design in the website version, and figure 4 presents themockup design in the website version.
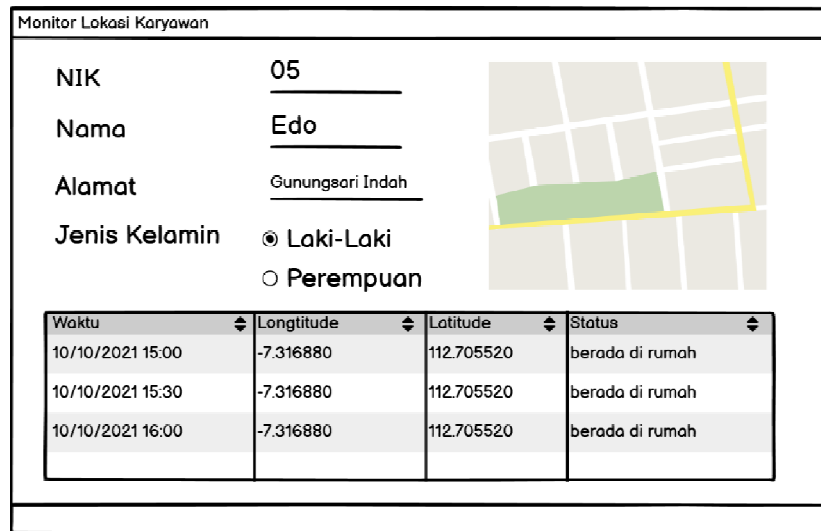
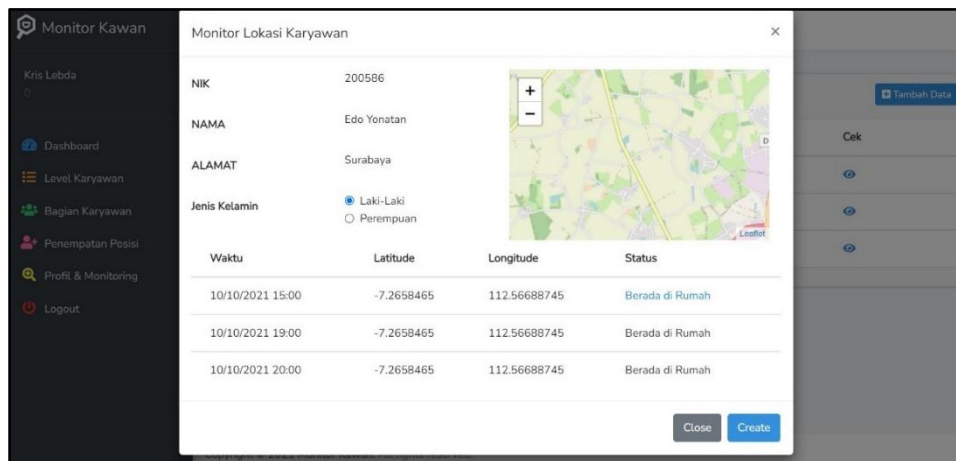**FIGURE 3:** Wireframe Design in Website Version of the Monitor Kawan Application.

FIGURE 4: Mockup Design in Website Version of the Monitor Kawan Application.

4.2 Create UI Design and Prototype: Mockup Design in Android Version

The second mockup design is the mockup design in the android version, which especially delineates the prototype of the Monitor Kawan application in the android version used by employees. In the mockup design in the android version, the user could execute a registration, login, modify password, look profile, monitor the location of employee working from the home, support system, and about menus. Also, the Android wireframe design has been depicted in Figure 5, and Figure 6 is implemented as an Android mockup design. In addition, looking from mockup design in the android version, the Monitor Kawan application in android will be integrated toward the Monitor Kawan web base, which the admin operates. Prior to that, the Android mockup design provides seven menus that consist of sign up, log in, modifying passwords, distinguishing dashboards (employees and manager respectively), profile, and employee location. The diversity factor in the android mockup design recognizes that it will be obtained by user's levels between employees and managers. On the employees' level, employees only will be capable of checking their self-location when employees work from home. On the other hand, on the manager's level, managers could ensure the position of their employees whether working from home in one department.
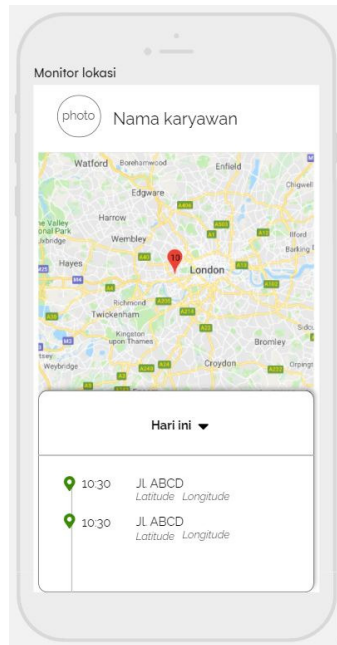
Edo Yonatan Koentjoro, Mega Pandan Wangi, Pradita Maulidya Effendi, Kristin Lebdaningrum & Dwi Cahyo Putro

FIGURE 5: Wireframe Design in Android Version of the Monitor Kawan Application.
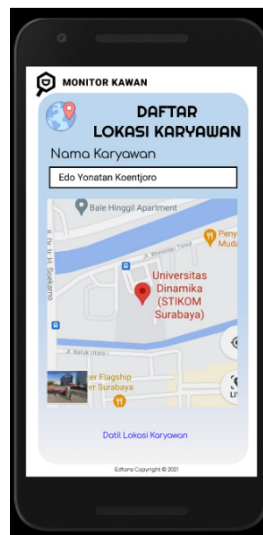

FIGURE 6: Mockup Design in Android Version of the Monitor Kawan Application.

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Edo Yonatan Koentjoro, Mega Pandan Wangi, Pradita Maulidya Effendi, Kristin Lebdaningrum & Dwi Cahyo Putro

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