



APPLICATION OF ANDROID-BASED PARKING VIOLATIONS REPORTING SYSTEM TO SUPPORT GREEN CAMPUS PROGRAM

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INTRODUCTION

"THE USE OF PRIVATE VEHICLES AT UNS CAMPUS"



The UNS currently has 35,382 students and 1,658 academic staff. Most of the students and academic staff use private vehicles as a mode of transport to the campus. Every day the number of motorcycles and cars that enter the campus are around 22,000 for motorcycles and 2,000 for cars. As the use of fuel consumption by automobiles is high, this will cause a high level of CO₂ in the campus environment.

The smartphone technology is advantageous for developing an application that helps humans with any daily life problems. It offers mobility and functionality such as Global Positioning Systems (GPS) module, a camera, and networking within android.



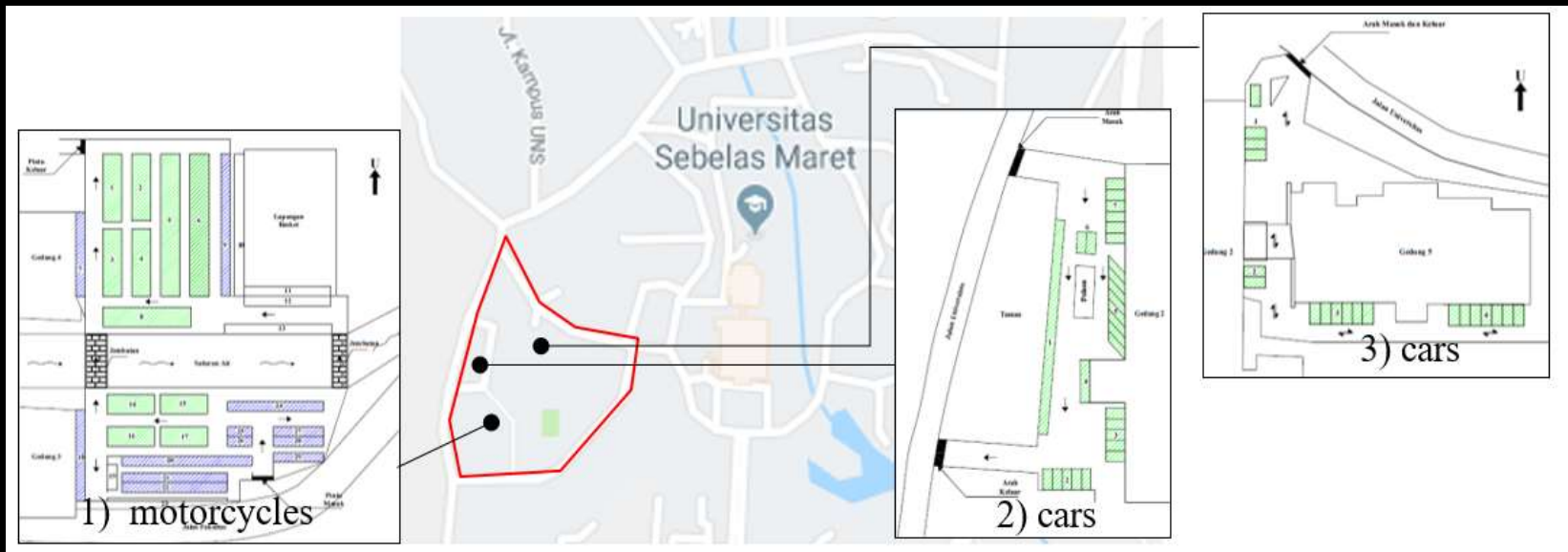
OBJECTIVE

The main objective of this research is to conduct parking management and develop an Android-based parking violations reporting application.

The application can be used to capture parking violation incidents in real time as part of monitoring and controlling the parking system in the Faculty Engineering (FE) UNS neighbourhood.

RESEARCH METHOD

Location. The location of research is at FE UNS parking area. The below figure shows the location of motorcycle and car parking areas viewed on Google Maps.



Tools. Android Studio an official IDE for Android application, PHP5, JavaScript, MYSQL and The Google Maps library



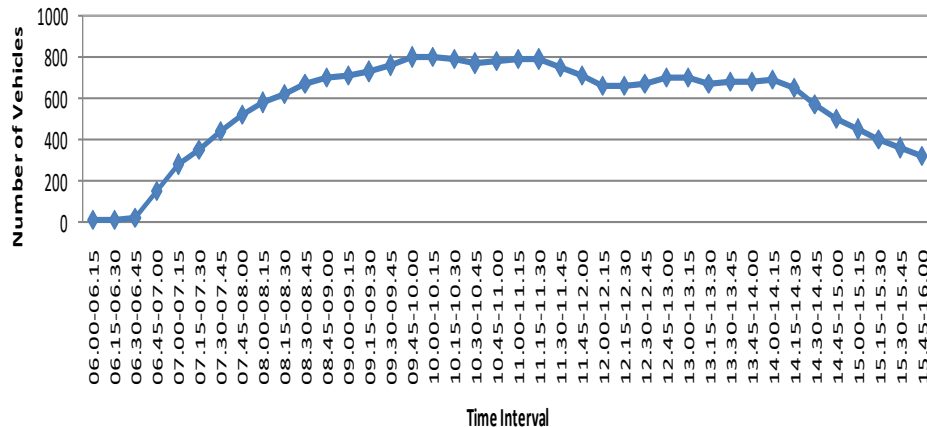
Steps. To Analyse of vehicle parking characteristics to determine the parking capacity, parking accumulation and parking index, and To develop a parking violations reporting application, called BuSet Parking App with web application with Php5 script.

RESULTS AND DISCUSSION

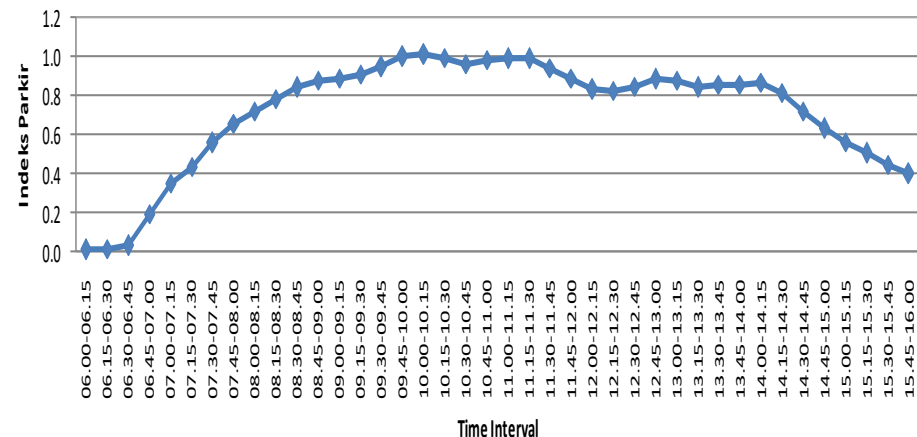
Vehicle parking characteristics. The below figure shows the fluctuation of motorcycle parking accumulation and parking index at parking area 1. The highest parking accumulation value is 804 motorcycles. During the time intervals of 09:45 AM – 11:30 AM, the parking accumulation exceeds the amount of parking capacity provided.

Therefore, the value of index parking at that time exceeds the value of 1.0. This has an impact on the emergence of illegal parking and violation of parking rules.

Motorcycles Parking Accumulation at Parking Area 1

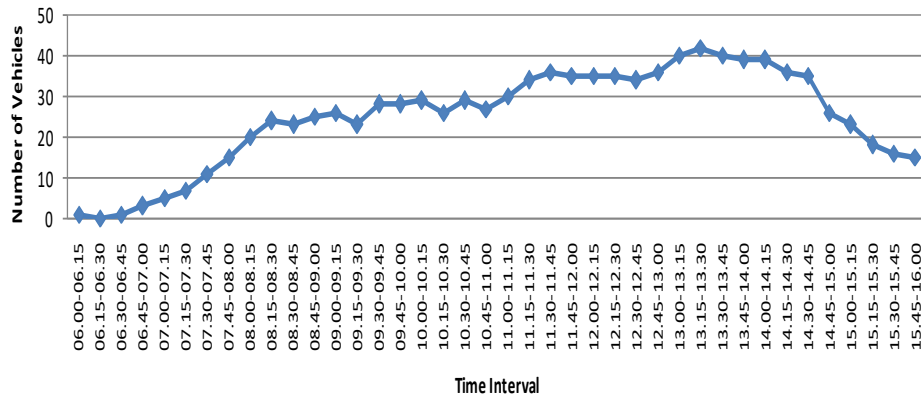


Motorcycles Parking Index at Parking Area 1

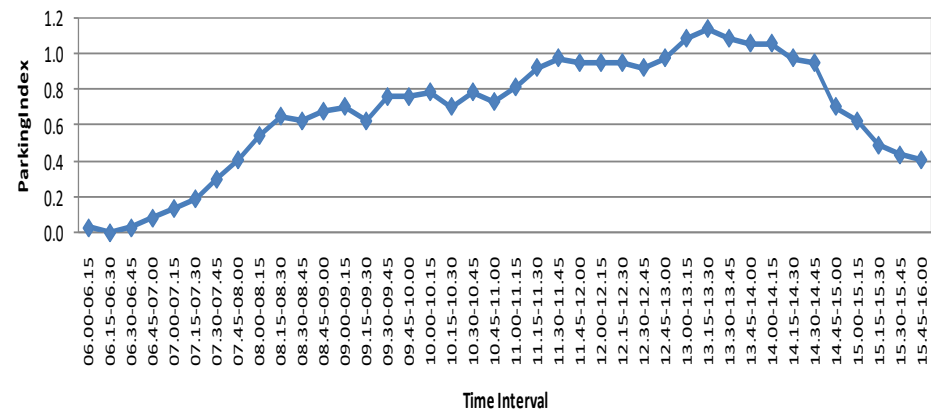


Vehicle parking characteristics. The below shows the fluctuation of car parking accumulation and parking index at parking area 2 and 3. The highest parking accumulation value is 42 cars and 20 cars, consecutively. During the time intervals of 01:00-02:15 PM and 09:45-10.45 AM, the parking accumulation exceeds the amount of parking capacity provided at parking area 2 and 3.

Cars Parking Accumulation at Parking Area 2

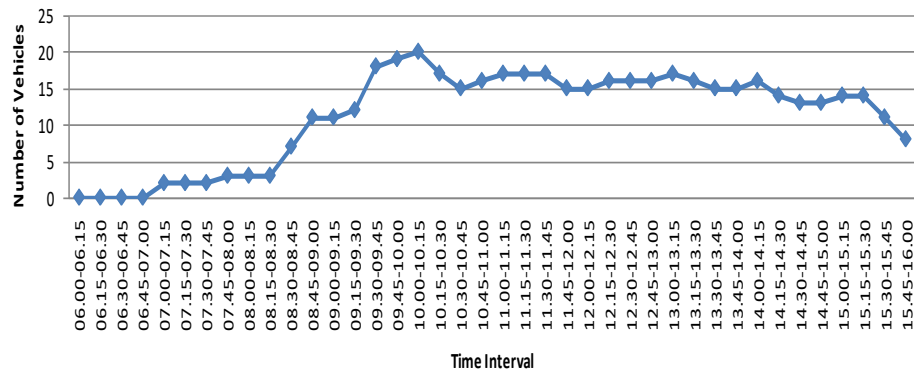


Cars Parking Index at Parking Area 2

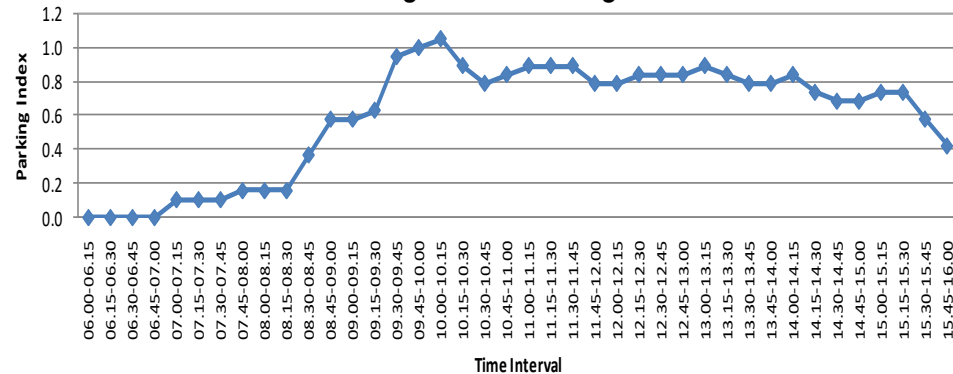


Therefore, the value of index parking at that time exceeds the 1.0. This has an impact on the emergence of illegal parking and violation of parking rules. Several cars parked in the canopy area and in the alley between the parks.

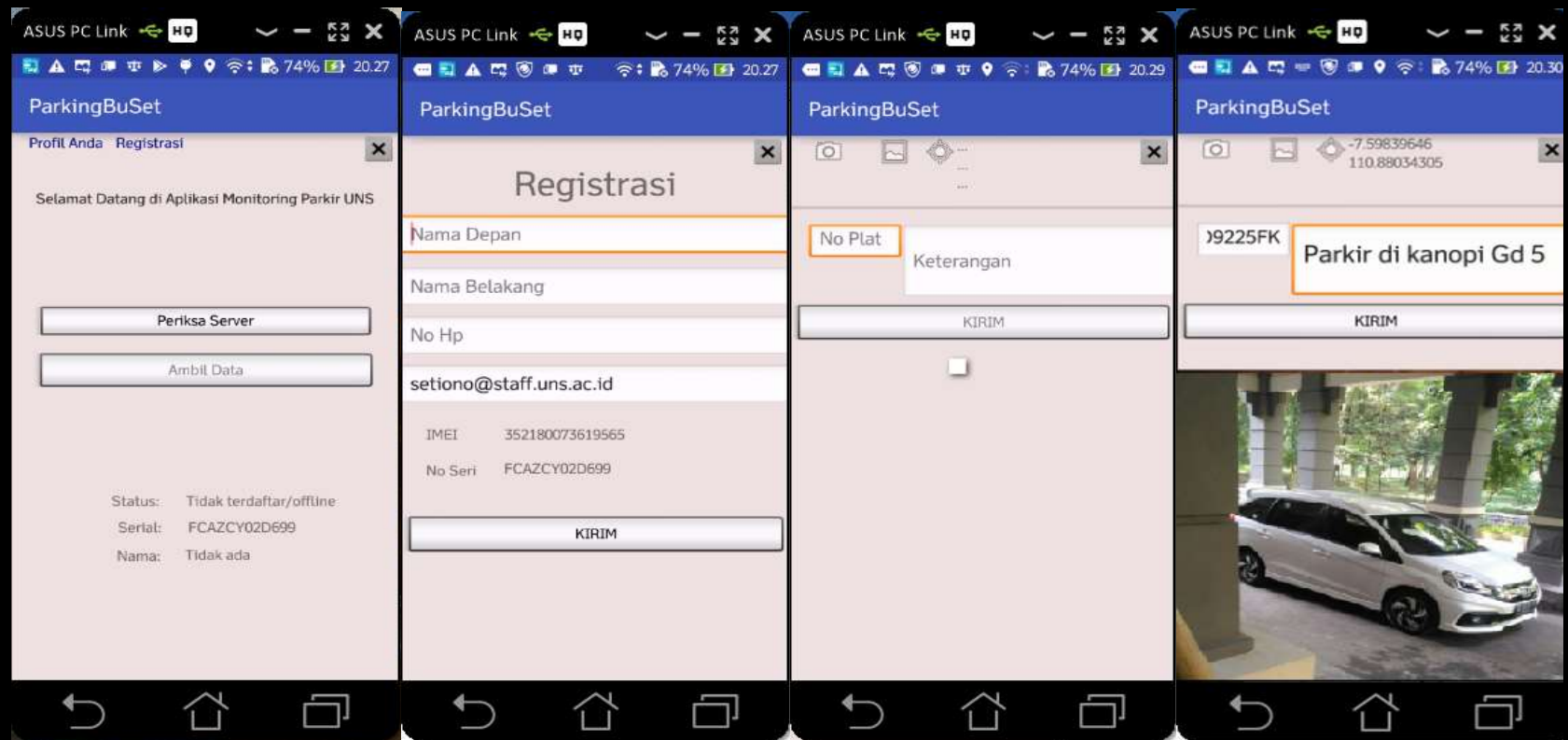
Cars Parking Accumulation at Parking Area 3



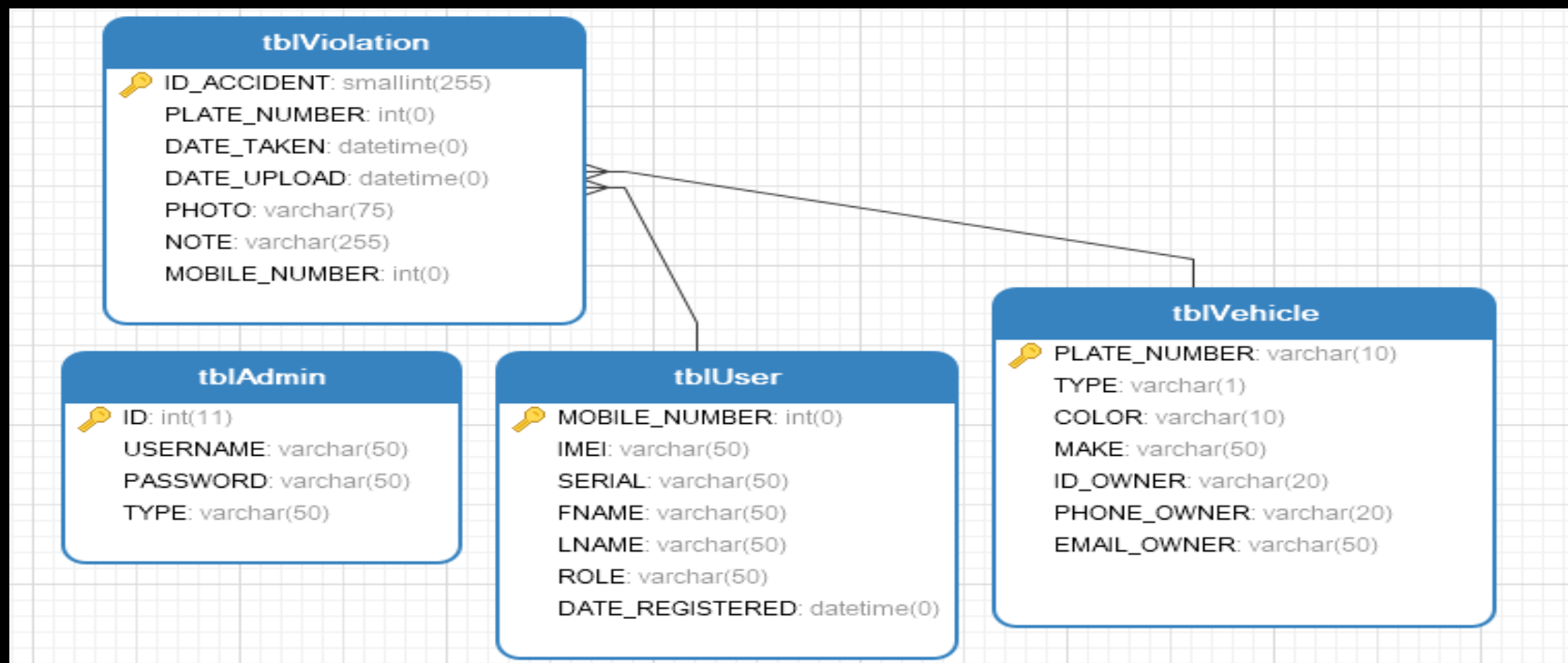
Cars Parking Index at Parking Area 3



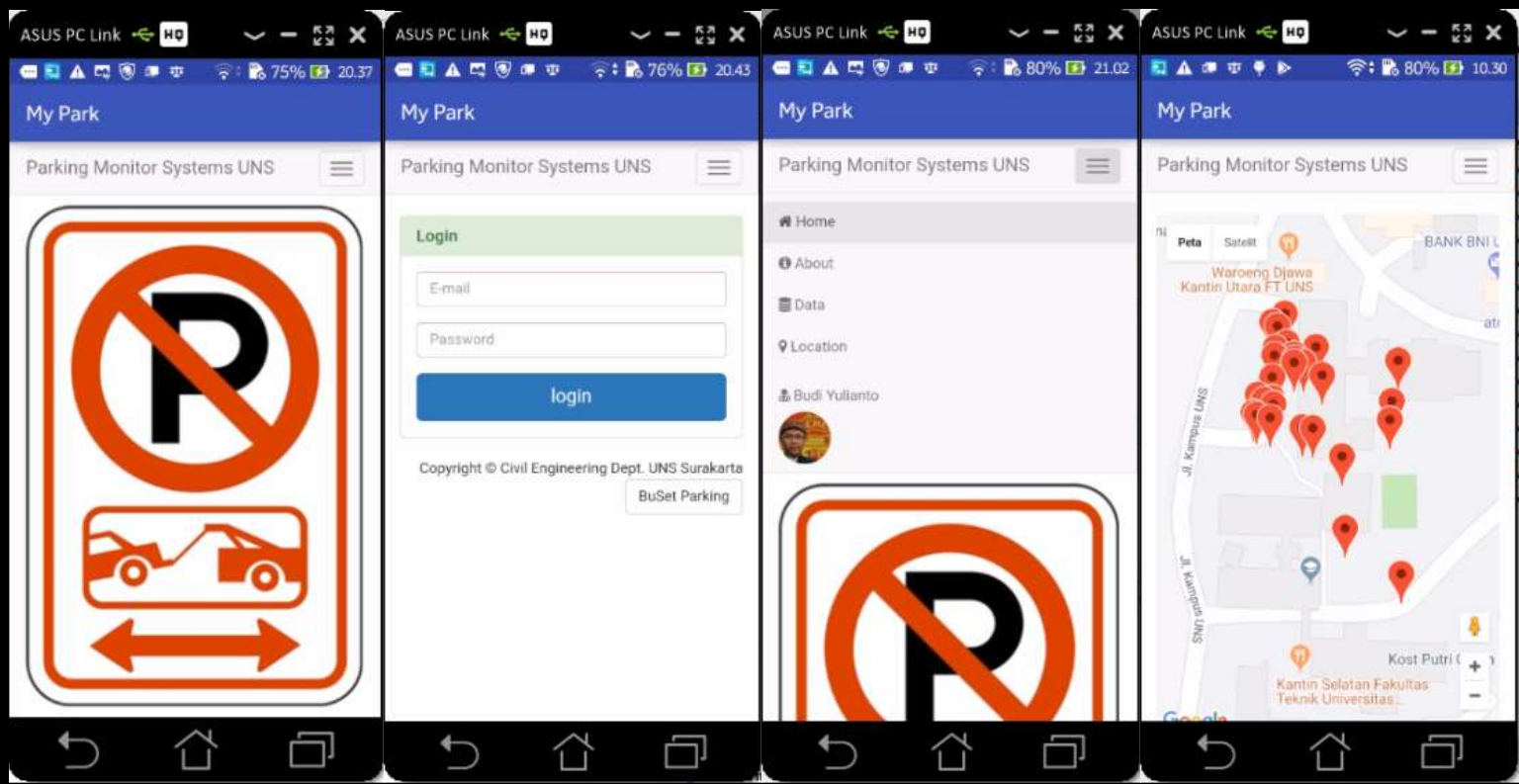
Android Application. the BuSet Parking App is developed with Android Studio - version android of 5.0.2 Lollipop. The system lock the user with IMEI and a phone serial number. An internet connection is required to do this process. A user has to register to the system before he/she can use the facilities in the application,



Database Modelling. The database for the application has four tables i.e. tblAdmin, tblUser, tblVehicle, and tblViolation. The entity relationship (E-R) diagram can be seen in below. The relationship of tblViolation towards tblUser and tblVehicles is Many to One. It implies that one vehicle can have more than one incident of violation as well as one user can record more than one incident.



Web parking violation management systems. The module of web user interface is built for administrative purposes. The module provides administrator capability of manipulating (insert, edit and delete) the data. The module can show the location of a parking violation incident and its picture as evidence. It is also designed to have the capability of sending a notification to the vehicle's owner regarding that incident.



CONCLUSION

- ✓ The analysis of vehicle parking characteristics results indicates that the parking index value at FE UNS parking area exceeds the value 1.0, thus causing parking violations.
- ✓ BuSet Parking App is developed for monitoring and controlling the parking system in the FE UNS neighbourhood. The application is able to record the location and time of the parking violation incidents along with the visual evidence of the infringement. This data will be used as evidence in punishing the offenders of the parking rules.
- ✓ The use of Android application makes it easier for the law enforcement department to conduct supervision, control and law enforcement against traffic violations due to its easy to use, simplicity, transparency and reliability.

THANK YOU

