STUDENT CREATIVITY PROGRAM PROPOSAL

SMART PARKING SYSTEM USING MOBILE APP UTILISING NFC AND QR CODE

FIELD OF ACTIVITY
STUDENT CREATIVITY PROGRAM PROPOSAL SCIENTIFIC ARTICLE

Proposed by:

AL AZHAR RIZQI RIFA'I F	2241720263	2022
DICHA ZELIANIVAN ARKANA	2241720002	2022
MAULANA DWI CAHYONO	2241720241	2022
MAULIA BALQIS ANSYA AULIA	2241720246	2022

STATE POLYTECHNIC OF MALANG
2022

TABLE OF CONTENTS

CHAPTER I
PRELIMINARY

PRELIMINARY

State Polytechnic of Malang has several parking lots which can be used by the students. It works like how a traditional parking lot would work. There is an entrance and exit gate, there is the guard who checks for the vehicle registration when the students exits the parking lot to make sure their vehicle legitimacy.

Even though there are already several parking lots, it's not a rare case to see a student can't find a suitable place to park their vehicle. This is due to the fact that the current parking lot are using a traditional system. Based on the testimony of some students, there are several issues that should be addressed, namely: The efficiency of the entrance gate, the time needed for the vehicle registration check, ease of access to the parking lot, etc.

In the era of technology, this situation can be improved by integrating some kind of system that can improve the effectiveness of the parking lot. Based on the environment of the parking lot, the solution can be as simple as creating an app which can then be used by the students. This app should be able to replace manual vehicle registration check, finding a spot in the parking lot, checking which parking lot is empty, checking the quota of the parking lot, etc.

With this solution in place, it is hoped that the effectiveness of the parking lot can be increased so that no more time wasted.

1.2 Problem Formulation

Based on the preliminary, the problem formulation can be explained as such:

1. How to integrate a system to the current existing parking system?
2. How can it improve the efficiency of the current system?
3. What kind of solutions should the new system provide in order to solve the current issues that the parking system has?
4. How to build a system that is easy to use and understand by the student?

1.3 Program Goal

The goal of the development of the new parking system can be defined as such:

1. Creating a system that should replace manual vehicle registration checking
2. Develop a system that should make it easy for student to check the parking lot quota
3. Create a system that should enable student to find the exact parking spot so they no longer need to find them manually
4. Build a system that is easy to use and easy to access by the current technology that the students have

1.4 Program Output

An obligatory output that is expected from this program can be defined as such:

1. A progress activity report of the program
2. A final report of the activity implementation
3. An app to implement the new parking system

Literature Overview

2.1 The Current Picture

The current parking system works fine, but there are several issues that can be resolved that should be able to improve the efficiency of the current working system. The details of those issues are described in this section.

The manual checking of the vehicle registration, this is probably one of the most time consuming part of the current parking system because each and every student who uses the parking lot need their vehicle registration to be checked manually by a single person at the entrance.

The current entrance is also an issue because there is no separation between the exit and the entrance gate. This is causing a line for those who want to enter the parking lot and those who want to exit. This is a very inefficient design because it waste students time.

At the moment, there is no way of knowing if a parking lot is already full or not without directly going there in person or ask other student who is already there. Student should be able to easily find this information easily to save their time.

Still related to the previous issue, students should also be able to find their exact position in the parking lot to reduce time wasted from finding a suitable location.

2.2 Overview of the Proposed Solution

With the presence of issues, of course it will make the current parking system inefficient. The proposed solution described in this section should be able to solve all the issues that presence in the current system.

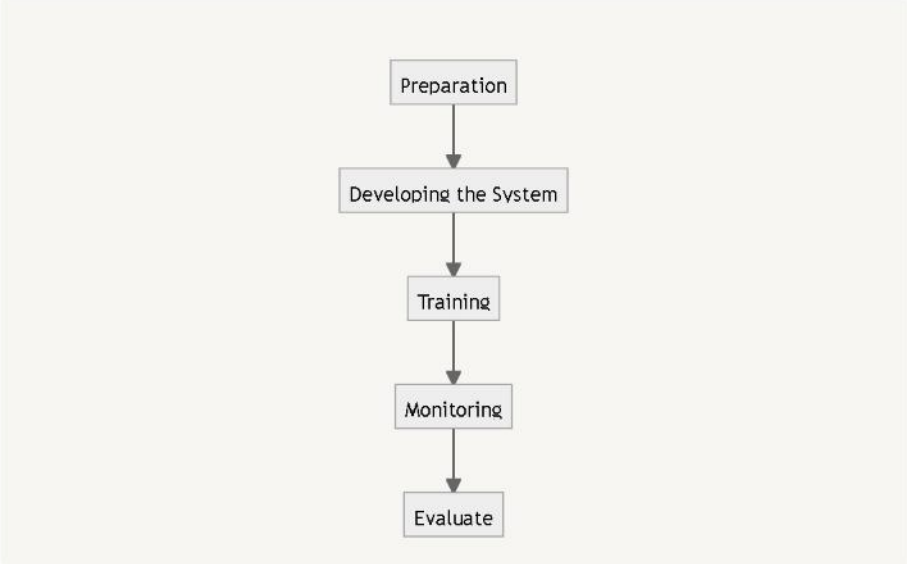
The manual checking of the vehicle registration should be able to be replaced by a system that requires each student to do a scan. Ideally this should be based on NFC because it is more efficient and faster to do than scanning a QR code. Although it is more efficient, it's not always present on every student's mobile phone. For that reason, there is also an option to scan a QR code for those who are not capable of using an NFC albeit less efficient.

The entrance should be divided between the entrance gate and the exit gate. Each gate should have different code for students to scan. On the entrance gate, they would scan to get their parking space position. Each grid will have a code and upon scanning, the student will be assigned a code and they should place their vehicle to the assigned spot. The benefit of this solution is that now everyone knows which spots are empty, how many empty spots are left, and they no longer need to find the spot manually because it has been defined by the system.

Although, this system rely on the discipline of the students. What if a student didn't park on their assigned spot? To tackle this issue, there will be a sanction that will be given to those who doesn't abide by the rules.

Methods of Implementation

There are several steps to implement the new system which can be seen in this diagram.



3.1 Preparation

The preparation step will be the first step taken to implement this new system. In this step, all of the prerequisites needed to develop this new system will be collected, including the calculation of the budget, the role, the schedule, and the materials.

3.2 Developing the System

The development step will consists of the implementation of the app and the card needed for the new system. The flow of the new system will also be developed in this step. The new app will be a mobile app that can be installed on Android and iOS. Mobile based app was chosen because every student already have a mobile phone and it has more access to the system compared to a web-based app. After the app has been developed, a usage documentation will be made.

3.3 Training

In this step, there will be a training to the users of the parking lot for the new system so that there won't be a confusion. Ideally this should be done on every students. In this training, the students will be taught how to use the app to check the empty parking lot, check their designated parking spot, check the available parking lot, as well as how to scan the code using either card or their phone. Not only that, the students will be informed about the rules that applies on this new system so that there won't be a violation due to the student's ignorance.

3.4 Monitoring

After conducting a training, the new system should be able to be applied. After it being applied, a monitoring step needs to be conducted to analyse the improvement that is made by this new system. This step is also used to determine whether or not the new system can be deemed as complete. If there are some issues regarding the new system, the system will be revised.

3.5 Evaluation

This is the last step of the entire process. In this step will be decided if the new system can actually increase the effectiveness of the old parking system.

TABLE OF SPENDING

No	Name Resources	Total Count	Price
1	Blank Card	100	Rp. 500.000
2	Chip Nfc	100	Rp. 800.000
3	Develop The application	1	Rp. 5.700.000