SDPM PROJECT

TITLE: University Parking Management System.

Submitted To:

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1.0 Introduction: This project is about a university parking space management system, which includes gates, some privileged vehicles, and some normal vehicles. Through this system, the university can manage a parking system for students, faculty, and other staff. The system will check the parking space availability before letting any vehicles in. Some private vehicles owned by universities can use the parking area for free, but other vehicles will be charged to use it. One must log in with their id and password to enter the parking space. Various operations, such as checking balance, verifying log in, checking available space in the parking lot, and payment clearance, will be done by the system then. If all conditions are approved successfully, the software system will let the gate open and one can park a vehicle.

This system will make it a lot easier for the institution to manage a large number of vehicles, boost security, and reduce costs for the university. The users, such as staff, faculty, and students, will benefit too.

2.0 Project Title: **University Parking Management System.**

3.0 Objectives: By end of this project, we aim to see a successful **University parking management system.**

The **objectives** of this proposed software system are:

1. Reduce time and increase efficiency of parking management system.
2. The system should provide details of the vacant parking slots in the vicinity and reduces the traffic issues around university gate
3. The system will use id to verify each vehicle and its owner, thereby reducing trespassing and illegal parking in the area.
4. The system will automatically check if the vehicle is chargeable or not, and if yes, it will calculate the amount and display it to the user which reduce the work of employees.
5. Verify and keep records of payment clearance.

The **goals** of this proposed software system are:

1. The goal of this system will reduce employee work and staffing costs for the institution.
2. Reduce time to search free parking spaces.

3. Increase security and stop unauthorized visitors from entering.
4. It will make it easier for universities to keep a record of people entering their university property.
5. Reduce traffic issues inside the university.

4.0 Justification: A university is a place where many students gather to learn. Some of them use their own cars, bikes, or other vehicles to get here. To give parking space to this vast number of vehicles, good parking management is needed. Therefore, the primary goal of this system is to provide an effective management system so that vehicles can park without incident through automated Ticket and Pass Management. It will also optimize the parking space, and many different groups of individuals will benefit from this management.

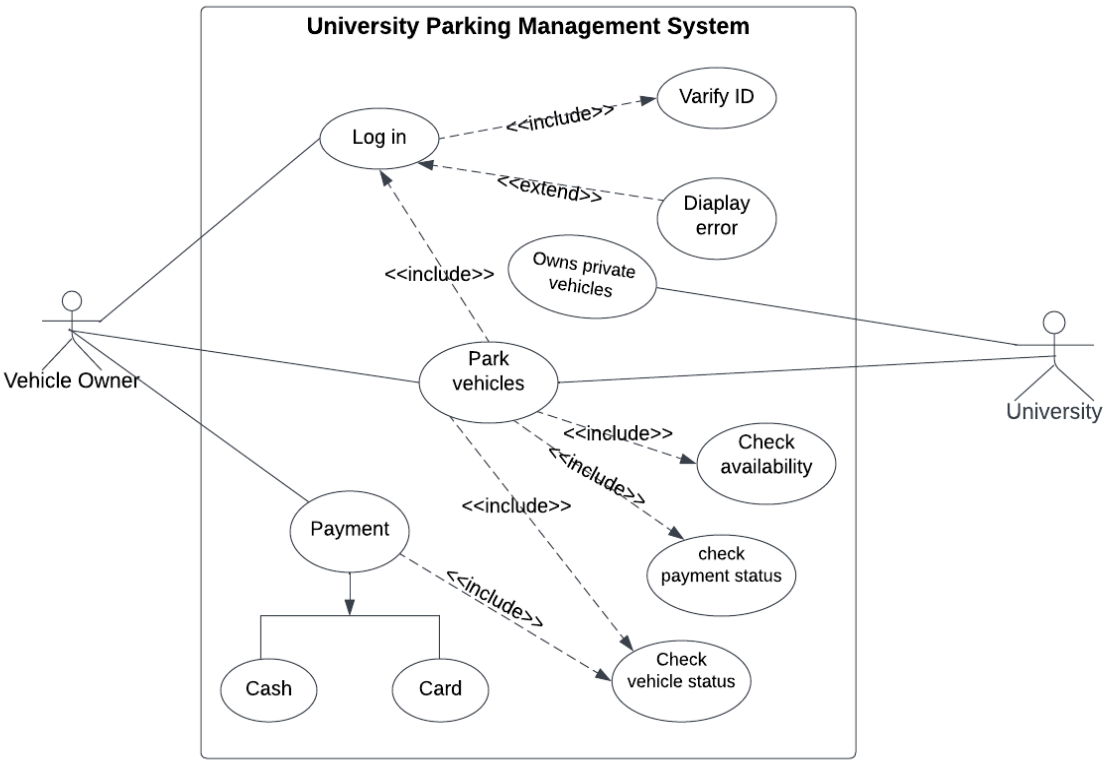
For instance –

1. **Campus faculty and employees** for optimizing time and making it easy to find empty parking spaces.
2. **University officials and students** are the primary stakeholders who will benefit from this management.
3. **General public** who walks by the university.
4. There will be less congestion in front of the university.
5. It will be cost effective for the **university trustees** as this system is automated, and universities don't need to appoint staff for parking management and security.

5.0 System Overview:

This concept is focused on a system for managing parking spaces at universities. The university can control the parking system for staff, faculty, and students using this technology. Before allowing any vehicles inside, the system will check the availability of parking spaces. Vehicles that are owned by universities can use the parking area for free, but other vehicles will be charged to use it. To access the parking space, a user must log in with their ID and password. The system will then perform a number of tasks, including balancing accounts, confirming logins, determining parking availability, and clearing payments. The software system will enable the gate to open and allow parking if all conditions are accepted successfully.

Use Case Diagram:



6.0 Stakeholders' analysis:

There are two sorts of stakeholders recognized for this project's development.

1. **Primary Stakeholders or Positive Stakeholders:** A positive stakeholder or primary stakeholder perceives the good aspects of the project and benefits from its success. These stakeholders contribute to the project management team's success.
2. **Secondary Stakeholders or Negative Stakeholders:** A negative stakeholder or secondary stakeholder experiences the project's unfavorable consequences and may be negatively influenced by the project. This sort of stakeholder is less helpful in completing the project**.**

In this project;

Primary Stakeholders or Positive Stakeholders are:

1. Campus faculty and employees
2. University officials and students
3. university trustees
4. General public

Secondary Stakeholders or Negative Stakeholders:

1. Visitors
2. Undisciplined personnel

7.0 Feasibility Analysis.

1. **Economic Feasibility.** This project is economically feasible in the sense that the money that was invested in purchasing registers to keep data for short periods can now be invested in a computer that does not need to be changed every year. So, a one-time investment in a computer reduces the expenses of the company. And the project itself is feasible as every piece of software used to make it is easily available on the internet.
2. **Technical Feasibility**. Our project results in a very simple and user-friendly outcome. The technical feasibility of the proposed system deals with the technology used in the system. It deals with the hardware and software used in the system, whether they are of the latest technology or not. It happens that after a system is prepared, a new technology arises and the user wants the system based on that technology. This system uses the Windows platform, PHP, and MySQL, making our project vehicle parking management system technically feasible.
3. **Operational Feasibility.** This project is operationally feasible in the sense that it is done on a computer. Data is more secure than before, reducing the risk of loss of data and updates in an automated manner, reducing the chances of error occurring. And this software does not require any other technical person to operate it, as a person with very little computer skills can do just fine.

8.0 System components:

Software components:

1. System Login
2. Id verification
3. Dashboard (will display verified satus)
4. Check parking availability status
5. Check vehicle status
6. Check PAYMENT status
7. Entry instruction (approve or disapprove)
8. Show available parking slot numbers.

Hardware components:

1. Cash collector
2. Camera
3. ID Scanner
4. Proximity Sensor

9.0 Process Model:

For this project V model is considered best.

The V-model is a development process used in software development that might be seen as an expansion of the waterfall model. The V-Model has Validation stages on one side and Verification stages on the other. Coding gradually works in a V-shape to combine the validation and confirmation processes. It is known as the V-Model when seen in this way.

Small projects with specified project criteria are used the V-Model. Simple, clear, and convenient to use. This paradigm emphasizes verification and validation tasks early in the life cycle, increasing the likelihood of producing a flawless product. Which maches very well with the criteria of our automated parking system project.

Aside from these,

- The V model is more comprehensive.
- It is more feasible compared to other models.
- Simple and easy to use.
- Testing activities like planning and test designing happen well before coding.
- Proactive defect tracking — that is, defects are found at an early stage.
- It avoids the downward flow of the defects.
- It works well for small projects where requirements are easily understood.
- And its success rate is higher than other models.

Considering all these facilities, the model justifies itself as a better model for our system.

10.0 Effort's Estimation:

Our project's estimates are calculated using the COCOMO model. Let's assume that the project will take up 6000 SLOC. The effort, development time, Required Number of people must now be calculated.

Coefficient<EffortFactor>= 2.4

Project complexity = 1.04, T= 0.35

We know,

Effort= PM= Coefficient<EffortFactor>* (SLOC/1000) ^P

= 2.4*(6000/1000)^1.4

= 29.48 persons-months

Development Time = DM = 2.50*(PM) ^ T

= 2.50*(29.48)^0.35

= 8.18 months

Required Number of people = ST = Effort (PM)/Development Time (DM)

=29.48/8.18

= 3.60 **~3 persons**

11. 0 Activity Diagram:

Activity	Duration	Precedence
A. Hardware Selection	3	
B. Software Design	4	
C. Install Hardware	3	A
D. Code	4	B
E. Test	3	B,D
F. File Take- On	2	
G. Write User Manual	9	B
H. Install & Test	2	C,D,E