INTRODUCTION

Parking attendants, who often spend hours sitting, observing, and analyzing parking tickets, may suffer from exhaustion, especially over extended periods of time. These traditional methods may lead to inefficiency due to the inevitability of human error, such as miscalculated tickets, incorrect time in and time out, loss of records, and so on. These challenges can lead to customer dissatisfaction and operational problems, especially in areas with frequent vehicle entries and exits.

This is where Parkner comes in - an application partner for parking attendants, where parking tickets are taken care of more efficiently. The application will provide staff with a digital tool to easily check real-time slot availability, record vehicle details, automate fee computation—reducing manual work and minimizing errors, and two ways of payment - online payments or cash. The system intends to enhance accuracy and security, reduce congestion, and improve overall efficiency in parking operations.

BACKGROUND OF THE STUDY

Through the years of this growing society, the increasing number of vehicles has placed significant pressure on parking infrastructures, especially in workplaces, schools, and commercial zones. Manual parking systems, which heavily rely on human intervention, often result in mismanagement, such as double slot booking, inaccurate fee computation, and difficulty in retrieving customer parking records.

A digital solution that would aid in automating and centralizing parking operations can significantly solve these issues. By utilizing a desktop application, staff can easily monitor parking space availability, log customer information upon entry, and track time to calculate and charge fees. Such a system can reduce administrative workload and minimize human errors.

This study is focused on designing and developing a Parking Management System tailored for use by staff in managing parking lots. It emphasizes real-time tracking, digital record-keeping, and efficient fee computation. By leveraging modern technology, the system seeks to modernize traditional parking management practices and provide a user-friendly platform that enhances both staff productivity and customer experience.

APP FUNCTIONS

The proposed application "Parkner" is designed to address the inefficiencies and limitations of traditional parking systems. It offers a suite of features aimed at assisting parking attendants in managing parking operations more effectively. The core functions of the application include:

- Real-Time Slot Monitoring
  - Parking attendants can add, edit, and view the total number of parking spaces and monitor their availability as cars come and go.

- Vehicle Entry and Exit Logging
  - Parking attendants can digitally log vehicle details such as:
    - Car Brand
    - Plate Number
    - Time-In
    - Running Time

- Digital Record-Keeping
  - All parking transactions and customer information are stored securely using Database Storage. This allows for easy retrieval of past records and improved data management.

- Automated Fee Calculation
  - Based on the recorded entry and exit times, the system automatically calculates the corresponding parking fee, minimizing the risk of miscalculations.

- Receipt Generation
  - Customers shall receive receipts before they exit. This ensures a reliable record of the parking transaction, providing transparency and serving as proof of payment for both the customer and management.

- QR Payment Integration
  - Allows customers to scan a QR code and pay through supported mobile wallets or banking apps. This helps reduce cash handling, speed up transactions, and improve customer satisfaction.

- Service History Tracking
  - Maintains a chronological record of all vehicle parking sessions, including dates, durations, and fees paid. This helps users and management view past usage, identify patterns, and resolve disputes if necessary.

- User-Friendly Interface

- The application is designed with an intuitive interface tailored for user use, ensuring easy navigation and reducing the learning curve.

These features aim to streamline parking lot management, thus reducing operational strain on staff. Also, while improving customer experience by ensuring a smoother, faster, and more accurate parking process.

SCOPE AND LIMITATIONS

The project focuses on the development of Parkner, a digital parking management application which aims to assist parking attendants to efficiently manage vehicle entries and exits and its operations within a parking facility.

The scope of the Parkner application includes:

- Real-Time Slot Monitoring - This displays available and occupied parking slots for easier management.
- Vehicle Logging - This allows the parking attendants to record the important details of the vehicle such as plate number, car brand, and time in/out.
- Automated Fee Computation - Calculating the parking fees automatically based on the duration of stay.
- Digital Ticketing/Receipt - The system issues digital parking receipts which gives the attendants a copy of a more clear and detailed record of parking transactions.
- Database Storage - This stores vehicle and transaction records, which are useful for future reference in case any issues occur.
- QR Payment Integration – Provides a convenient, contactless way for customers to pay through mobile wallets by scanning a QR code, reducing cash handling and enhancing transaction speed.
- Service History Tracking – Maintains a log of each vehicle's parking history, including dates, durations, and fees, useful for monitoring usage and resolving disputes.
- User-Friendly Interface – The system is designed with simplicity to ensure staff can operate the application with minimal effort.

In spite of the fact that Parkner offers various features that helps to improve parking operations, the following limitations are acknowledged:

- Hardware Compatibility and Integration. The accuracy of real-time parking slot monitoring is contingent upon the proper integration of external sensors or consistent manual updates. In the absence of compatible hardware, the reliability of slot availability data may be compromised.

- Limited to Attendant-Operated Use. The system is designed primarily for use by parking attendants, with no provision for direct customer interaction or self-service functionality. This design choice may limit scalability, particularly in facilities aiming for automation or

customer-driven services.

● Manual Data Entry Vulnerabilities. Despite the digitization of parking operations, the system requires manual input of vehicle information by attendants. This reliance on human data entry introduces the potential for inaccuracies and inconsistencies.

● Customer Disputes Handling. The current version of the system lacks integrated features for managing customer complaints, charge disputes, or refund processing. This absence may hinder effective conflict resolution and reduce overall customer satisfaction.