CHAPTER 1

INTRODUCTION

1.1 Introduction

Transportation is the most needed facility in our daily life. We need to travel from one place to another for the various purposes. The only transportation service available in Nepal is public or private vehicles. With the increasing number of populations, the number of vehicles is also increasing but the availability of parking space is becoming very less. Damak Vehicle Parking Service is a parking area located in Pashuhat, Damak. It aims on providing the vehicle parking facility with the focus on security on the busy city of Damak. Our team has developed the system to facilitate the parking area. This system helps to manage various operations in Damak Vehicle Parking Service.

1.2 Problem Statement

- Managing vehicle details, entry and exit information, space availability, parking slot booking, billing was completely manual, difficult and time consuming.
- Parking fees payment was hand to hand.
- It was difficult to generate the report.

1.3 Objectives

The objectives of this case study are to develop a system for Damak Vehicle Parking Service in order to automate all the operations. The main objectives are given below:

- Vehicle information management
- Vehicle entry and exit information management
- Keep track of space availability for parking
- Online parking slot booking
- Payment and billing management
- Report generation

1.4 Scope and Limitation

1.4.1 Scope:

The scope of this case study is to analyze and study all the operations of the Damak Vehicle Parking Service which were all manually done previously and try to automate them through our system. The main scopes are given below:

- Our system will be easier to understand and use.
- Our system can make vehicle information management easier.
- Our system can keep information like entry and exit information of vehicle, vehicle type, total vehicle parked time, availability of parking space etc.
- Our system can properly manage payment and billing information.
- Our system can provide the platform for booking the parking space through online medium.

1.4.2 Limitation

- Our system will only be available to Windows Operating System.
- Each and every part of the system is not described here.

1.5 Development Methodology

We are using **waterfall methodology** as development methodology.

Waterfall model, also called the linear sequential model, is the oldest and most widely used procedure for Information System (IS) development. It is a formalized step by step approach to System Development Life Cycle (SDLC) which consists of phases and activities. The activities of one phase must be completed before moving to next phase. The various activities of traditional waterfall model are shown in the figure below.

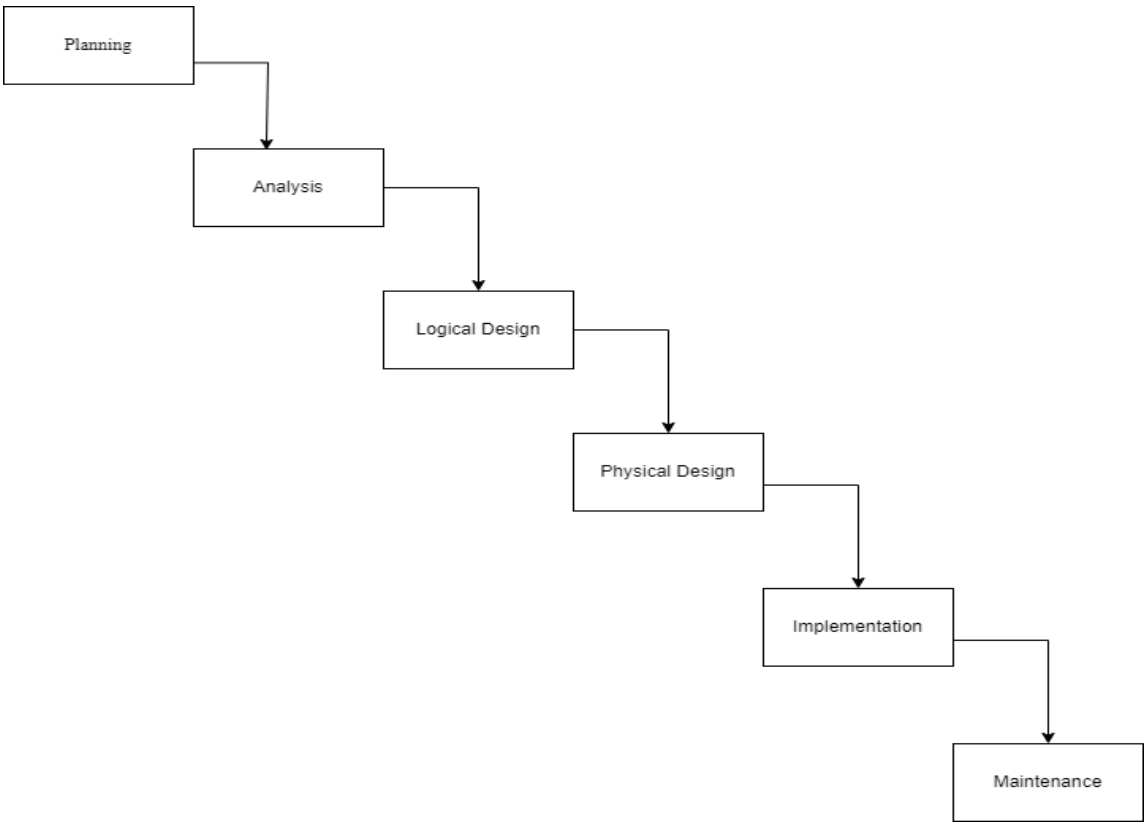


Fig. 1: Waterfall Model

Advantages of Waterfall Model:

The advantage of waterfall model is that it allows for departmentalization and control. Each phase of development proceeds in strict order. Some further advantages are:

- Simple and easy to understand and use.
- Easy to arrange tasks.
- Clearly defined stages.
- Process and results are well documented.

We have used the Waterfall model in our project since it is suitable for our project due to various reasons.

- All the requirements for the system are fully identified.
- The end goal of our case study is clearly defined and it is not going to change.

1.6 Report Organization

This case study report is separated into different chapters. Each chapter consists of various sub-chapters with the content. The opening section of the report consists of cover page.

In this case study report, the first chapter contains the Introduction and its sub chapters. The sub chapters of Introduction part include Introduction, Problem Statement, Objectives, Scope and Limitation, Development Methodology and Report Organization. The second chapter contains the Background Study. The third chapter contains System Analysis with its sub chapters requirement analysis, feasibility analysis.

CHAPTER 2

BACKGROUND STUDY

2.1 Background Study

Damak Vehicle Parking Service is a web-based application and parking area located in Pashuhat, Damak. It aims to provide a secure place for vehicles in the busy city of Damak. With more people and more vehicle, finding parking has become difficult.

Our team created a system to help manage the parking area better. This system keeps track of parked vehicles, their entry and exit times, and makes sure the space is used efficiently. It also includes security features like surveillance cameras and controlled access to keep the vehicles safe.

Users can easily access the Damak Vehicle Parking Service through its web application. They can check for available parking spaces, book a spot in advance, and view their parking history. Payment for the parking service can also be done online, making the process smooth and convenient.

Damak Vehicle Parking Service helps solve the parking problems in Damak, making it easier for residents and visitors to find a safe place to park their vehicles.

CHAPTER 3

SYSTEM ANALYSIS

3.1 System Analysis

System analysis involves examining a business or organizational system to understand its components, interactions, strengths, and weaknesses, with the aim of identifying potential improvements. This analysis for the Vehicle Parking System includes a thorough examination of the system's requirements, feasibility, and a structured or object-oriented analysis of its operations.

OBJECTIVES

1. Identify Challenges:
    - Determine the root causes of issues affecting the Vehicle Parking System. This involves looking into aspects such as manual entry and exit processes, inefficient space allocation and payment delays.

2. Propose Solutions
    - Suggest practical and effective solutions to overcome the identified challenges. Solutions may include implementing automated systems for entry and exit, real-time space management technologies, enhanced payment systems, and advanced reporting tools.

3. Improve Efficiency and Satisfaction
    - Enhance the overall operational efficiency of the parking system. This includes speeding up processes, reducing errors, and ensuring smooth operations. Additionally, aim to increase user satisfaction by making the system more user-friendly, reliable, and secure. This may involve improving the interface, ensuring data protection, and offering convenient payment options.

3.1.1 Requirement Analysis

Requirement analysis is a crucial component of system analysis. It involves identifying and documenting the specific needs and requirements of a business or organizational system to understand what the system must do and how it should function. For the Vehicle Parking System, requirement analysis is mainly categorized into two types:

1. Functional Requirements:

    1) User Registration Authentication:
        - Register new users (vehicle owners).
        - Authenticate users for secure access.
    2) Vehicle Entry and Exit:
        - Capture vehicle details upon entry.
        - Record entry time.
        - Capture vehicle details upon exit.
        - Record exit time and calculate parking fee.
    3) Parking Space Management:
        - Display available parking spaces.
        - Allocate parking spaces to vehicles
        - Update space availability in real-time.
    4) Payment Processing:
        - Calculate parking fees based on duration.
        - Support multiple payment methods (cash, card, mobile payments).
        - Issue receipts.
    5) Notifications and Alerts:
        - Notify users of parking space availability.
        - Send reminders for payment.
        - Alert system administrators about system issues.
    6) Reporting:
        - Generate reports on parking lot usage.
        - Provide financial reports on collected fees.

2. Non-Functional Requirements

    1) Scalability:

- Support an increasing number of users and vehicles.

2) Reliability:
   - Ensure high availability and minimal downtime.
3) Security:
   - Protect user data and transaction information.
   - Implement access controls.
4) Usability:
   - Provide a user-friendly interface.
   - Ensure ease of use for both users and administrators.
5) Performance:
   - Fast processing of vehicle entries and exits.
   - Quick updates of parking space status.

3.1.2 Feasibility Analysis

Feasibility analysis is the important step in the planning phase of a project. It can be considered as preliminary investigation that helps to take decision about whether the development of a system is feasible or not. It identifies the possibility of improving an existing system, developing a new system, and produce refined estimates for further development of system. It is the process of evaluating the viability of a proposed project, and determining whether it is both technically and economically feasible to pursue. The purpose of feasibility analysis is to identify potential risks and challenges associated with the project, and determine whether it makes sense to invest resources in its development. The results of the feasibility analysis are typically documented in a feasibility report, which outlines the strengths and weaknesses of the project, as well as any potential challenges or risks. This report can then be used to determine whether the project should be pursued further, and if so, what steps need to be taken to ensure its success.

The types of feasibility analysis for our project are:

1. Technical feasibility:

All the necessary cautions have been taken to make the project technically feasible. We evaluated the availability of necessary technology to implement and operate the system. We also considered the ability of

technical team to develop and maintain the system, as well as any potential technical risks or obstacles that may impact the success of the project.

2. Operational feasibility:

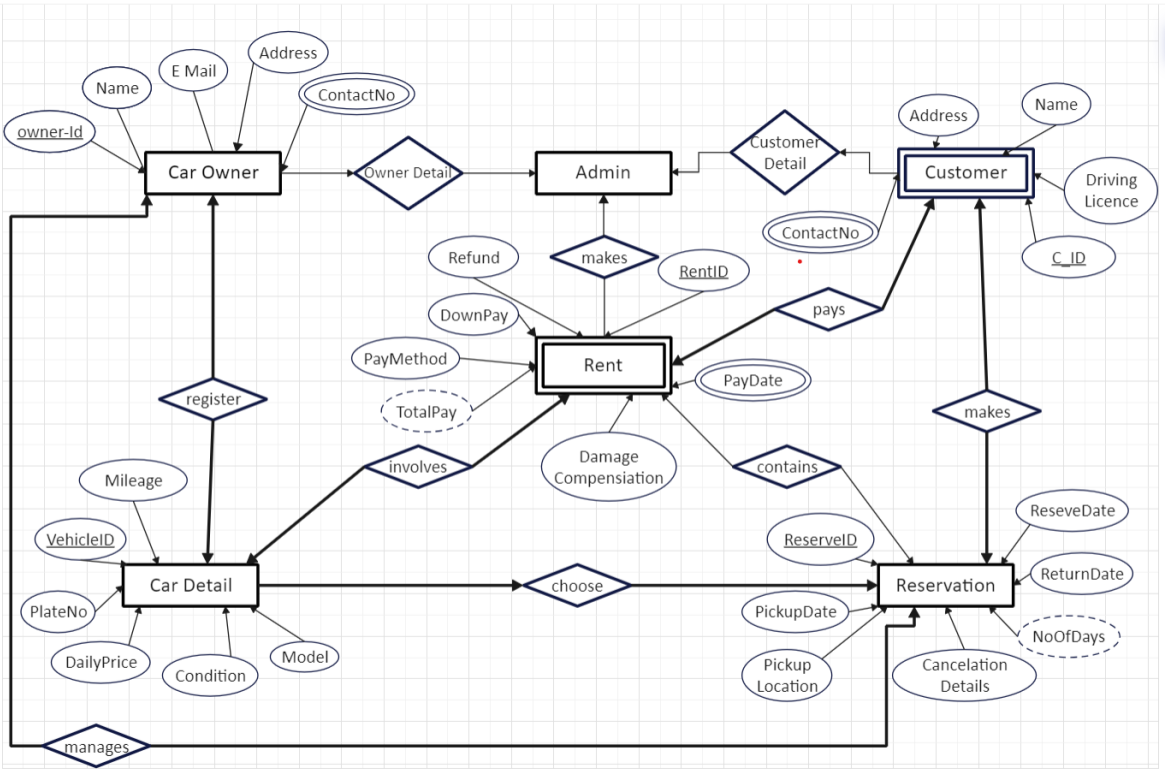
The application has been designed using user-friendly GUI tools so it is very simple to use. The user has simple access to all the application's features. This system can be integrated into the organization's existing operations and processes without disrupting day-to-day activities.

3. Economic feasibility:

We have evaluated the financial viability of the system. This includes assessing the costs associated with the developing and implementing the system as well as the potential benefit and return of investment. We also considered the long-term financial implications of the system, including maintenance costs, upgrades, and any other ongoing expenses associated with running the organization.

3.1.3 Analysis

ER DIAGRAM



USE CASE DIAGRAM