



# CPIS-250 REPORT

May 2022

## PREPARED BY:

Maryam Bakraa	2008965
Joud Noumani	2009421
Jana Daba	2005613
Tala Althunaiyan	2006012
Maria Tamim	

## PREPARED FOR:

CPIS250 Instructors\  
Miss Lamees Fakhurji  
DR. Hind Baitar



# Smarkey

Smart Parking System

# Table of Contents

## *Chapter One: System Analysis*

### **1.1 Problem Definition**

1.1.1 Problem Description	3
1.1.2 Problem Statement	3
1.1.3 Sources of Domain Analysis Information	3
1.1.4 Scope of the System	3

### **1.2 Domain Analysis**

1.2.1 Introduction	3
1.2.2 Glossary	4
1.2.3 General Knowledge About the Domain	4
1.2.4 Customers and Users	4
1.2.5 The Environment	4
1.2.6 Tasks and Procedures Currently Performed	4
1.2.7 Competing software	4

### **1.3 Use Case Model**

1.3.1 Actors of the system	5
1.3.2 Use Case Diagram	5
1.3.3 Use Case Descriptions	5

### **1.4 Functional Requirements**

### **1.5 Non-Functional Requirements**

## *Chapter Two: System Design*

### **2.1 UML System Domain Model**

### **2.2 Class Diagram**

### **2.3 System Architecture**

### **2.4 Sequence Diagrams**

### **2.5 Activity Diagram**

### **2.6 State Diagram**

## *Chapter Three: System Implementation*

### **3.1 User Interface Prototype**

## *Chapter Four: Testing*

### **4.1 Test Plan and Test Case**

## **PROBLEM DEFINITION**

### Problem Description:

More and more the traffic is increasing in our university, creating chaos, air and acoustic pollution, and student frustration. Furthermore, parking areas are limited due to drivers parking in student designated areas. There is no structure or entity to organize the placement of vehicles in parking spots.

### Problem Statement:

Our project will involve the creation of a valet parking application called “Smarkey”. This application will allow female students to book with a valet company that picks up and delivers the car at the gate.

### Sources of Domain Analysis Information:

We conducted study with female faculty members that included interviews and asked them how they viewed the current parking process at KAU.

### Scope of the System:

Making an application where female students can subscribe to a valet parking service that takes their cars from the gate and park it, and later, when leaving, their cars are brought to the gate.

# SYSTEM ANALYSIS

## DOMAIN ANALYSIS

---

### Introduction:

The application "Smarkey" makes it easier for female faculty members by offering valet parking. This will help them reach their classes on time , reduce time, fuel, stress, improve traffic efficiency, and improve security of the parking lots. They will no longer have to worry on a daily bases about finding a parking spaces near their designated gates.

### Glossary:

- Application: a software program designed to perform specific functions for a user.
- Costumer: a person or organization that buys goods or services from a store or business. It this report, the customer is the person using the application.
- User interface: the visual aspect of the android application on the user's phone that allows user interaction with the system.
- QR code: is a two-dimensional version of the barcode, typically made up of black and white pixel patterns.
- Database: a database is an organized collection of data stored and accessed electronically.
- Rating: a classification or ranking of someone or something based on a comparative assessment of their quality, standard, or performance.
- University Email: is an email address that each person is given when enrolling in college or hired by them .
- Package: a set of proposals or terms offered or agreed as a whole.
- Apple pay: is a mobile payment and digital wallet service by Apple Inc
- Credit: is a payment card issued to users to enable the cardholder to pay a merchant for goods and services based on the cardholder's accrued debt.

# SYSTEM ANALYSIS

## General Knowledge About the Domain:

The application will allow users to sign-up via university email and then input a description of their car. Users will be expected to choose one of the packages displayed on the applications and will proceed with the payment process. The system will send the receipt to the users email with the generated barcode and will print it to place it on the car. Later, the users can then book a valet parking the day prior to needing it. The system will then send a verification email to the user and automatically decrement the allowable bookings from the package.

## Customers and Users:

- Customers
- Administrator
- Owner
- Staff

## The Environment:

Ensure that the website is compatible with Apple's iOS and Google's Android operating systems. Many programming languages will be used to build the website. Improve the website interface to make it easier for consumers to use.

## Tasks and Procedures Currently Performed:

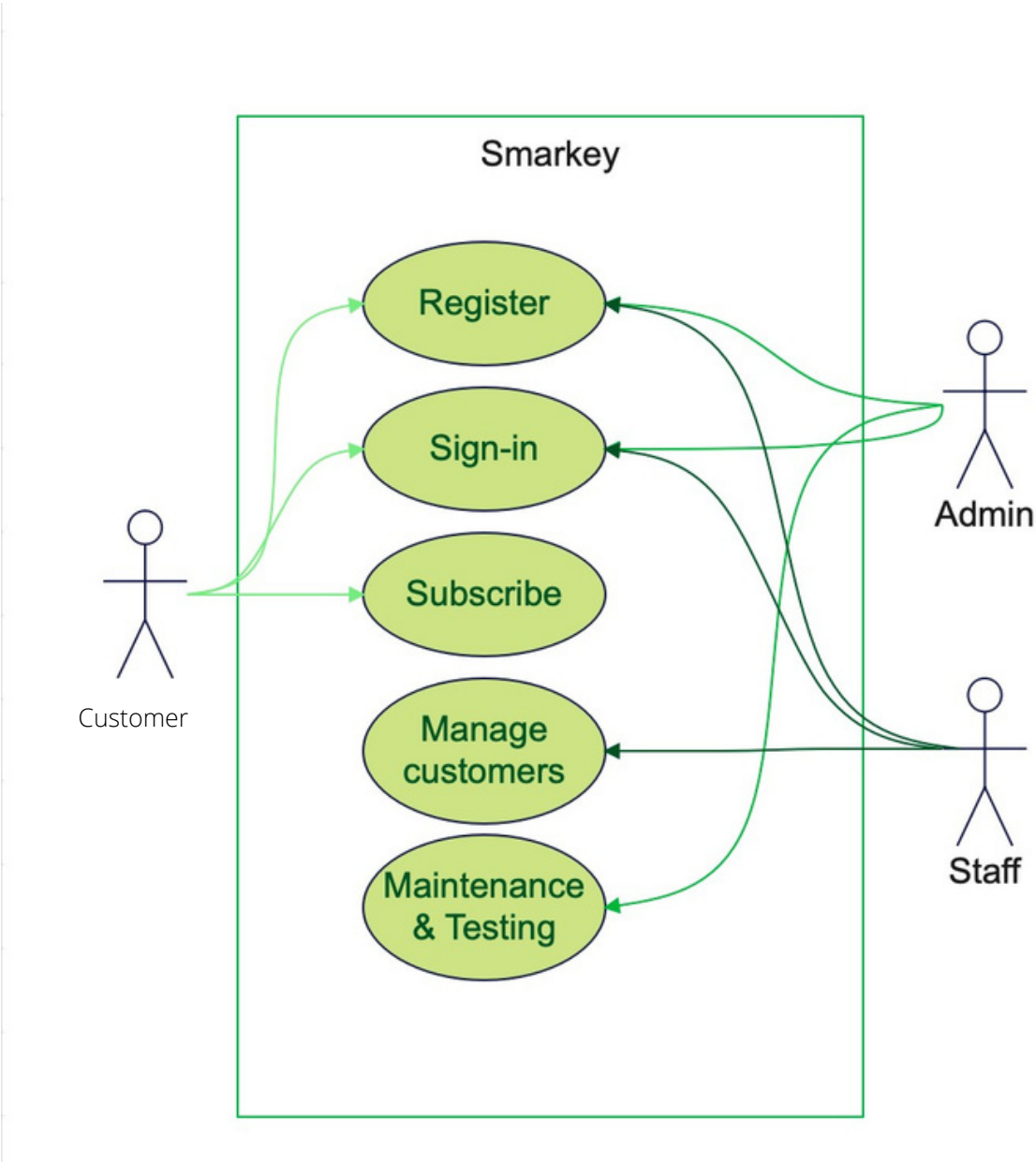
## Competing Software:

Since there is no valet parking service in the campus of King Abdulaziz University, Smarkey is the first of it's king in campus.

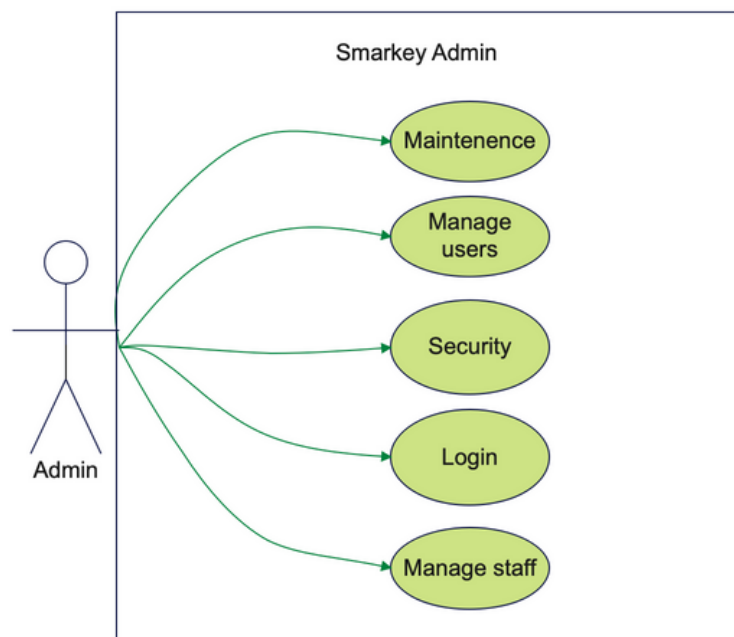
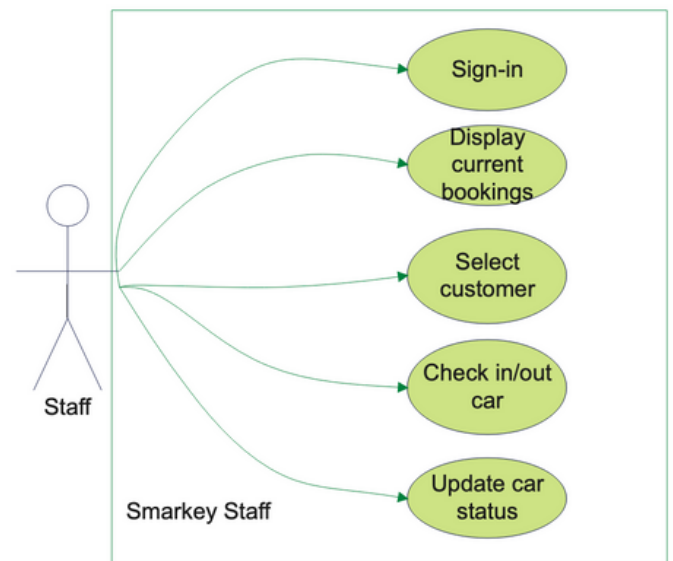
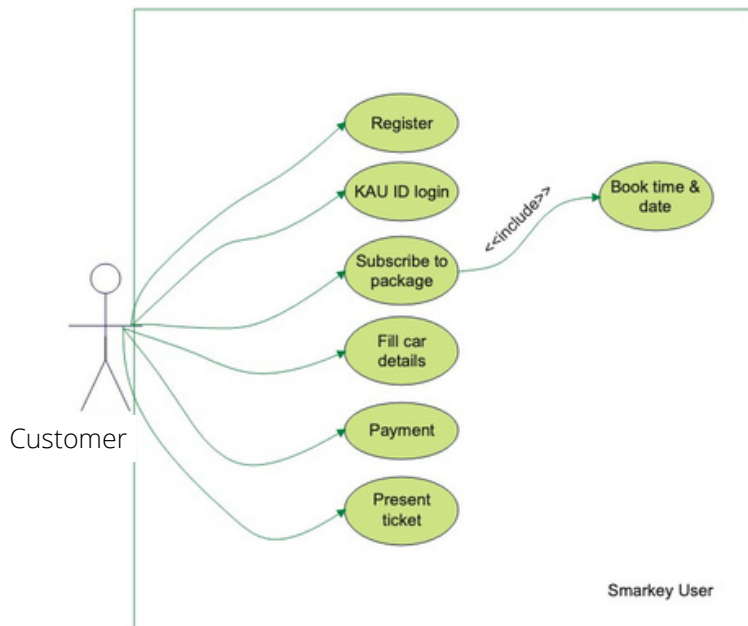
## USE CASE MODEL

Actors: Customer,Staff, Admin.

Use Case Diagram:



## USE CASE MODEL



## USE CASE MODEL

---

### Use Case Description:

**Description:** All the actors can register in the application and sign-in. The customer can additionally subscribe in a package for a parking. The admin can maintain the application and test it. Staff members can manage the customers of the application.

### **Actors :**

- Customer
- Admin
- Staff

**Pre-conditions:** All customers should have a KAU ID

**Post-conditions:** The purchased booking is immediately available for display

### **Flow of events:**

- 1- The customer should sign-in or sign-up to Smarkey
- 2- The customer can then book a parking and recharge their balance
- 3- The customer chooses their subscription package
- 4- The customer pays for the package, and chooses the payment method
- 5- The customer chooses a parking time
- 6- The application displays the parking details



## FUNCTIONAL REQUIRMENTS

---

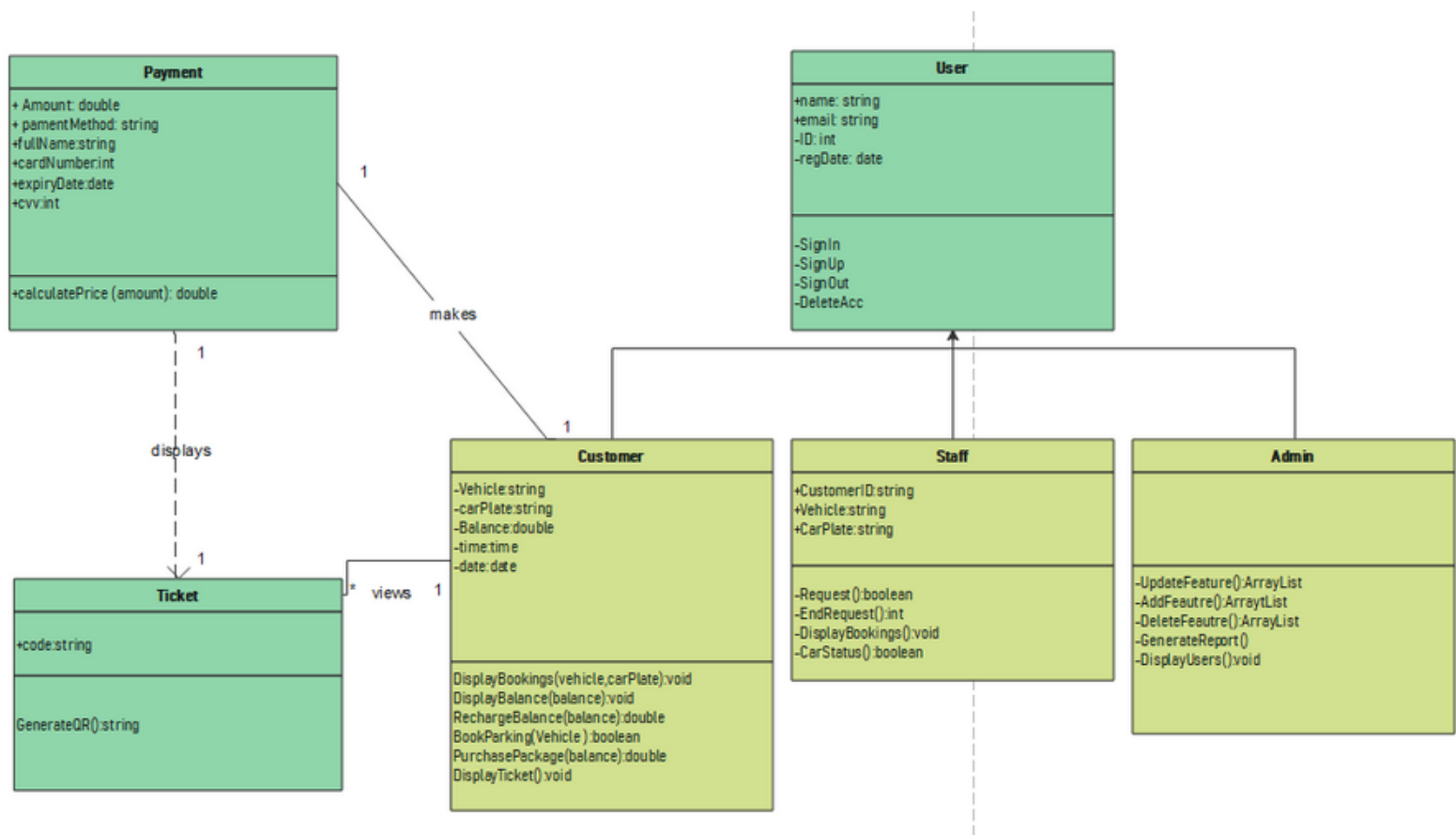
- This application will allow users to sign-up using university emails
- This application will allow users to input a description of their car
- This application will generate a barcode for each user
- This application will allow users to pick a valet package
- This application will allow users to pay for application -package
- This application will allow user to print the barcode
- This application will allow users to book spots and dates
- This application will send a verification receipt through email to validate the booking
- This application will allow users to sign-out

## NON- FUNCTIONAL REQUIRMENTS

---

- This application should be intuitive and user-friendly.
- This application should have a fast response time
- This application should have high recovery time when facing failure
- This application should be designed to handle overestimated number of users
- This application should be designed to make updates and fixes easily to implement
- This application should be available in many platforms

UML CLASS DIAGRAM

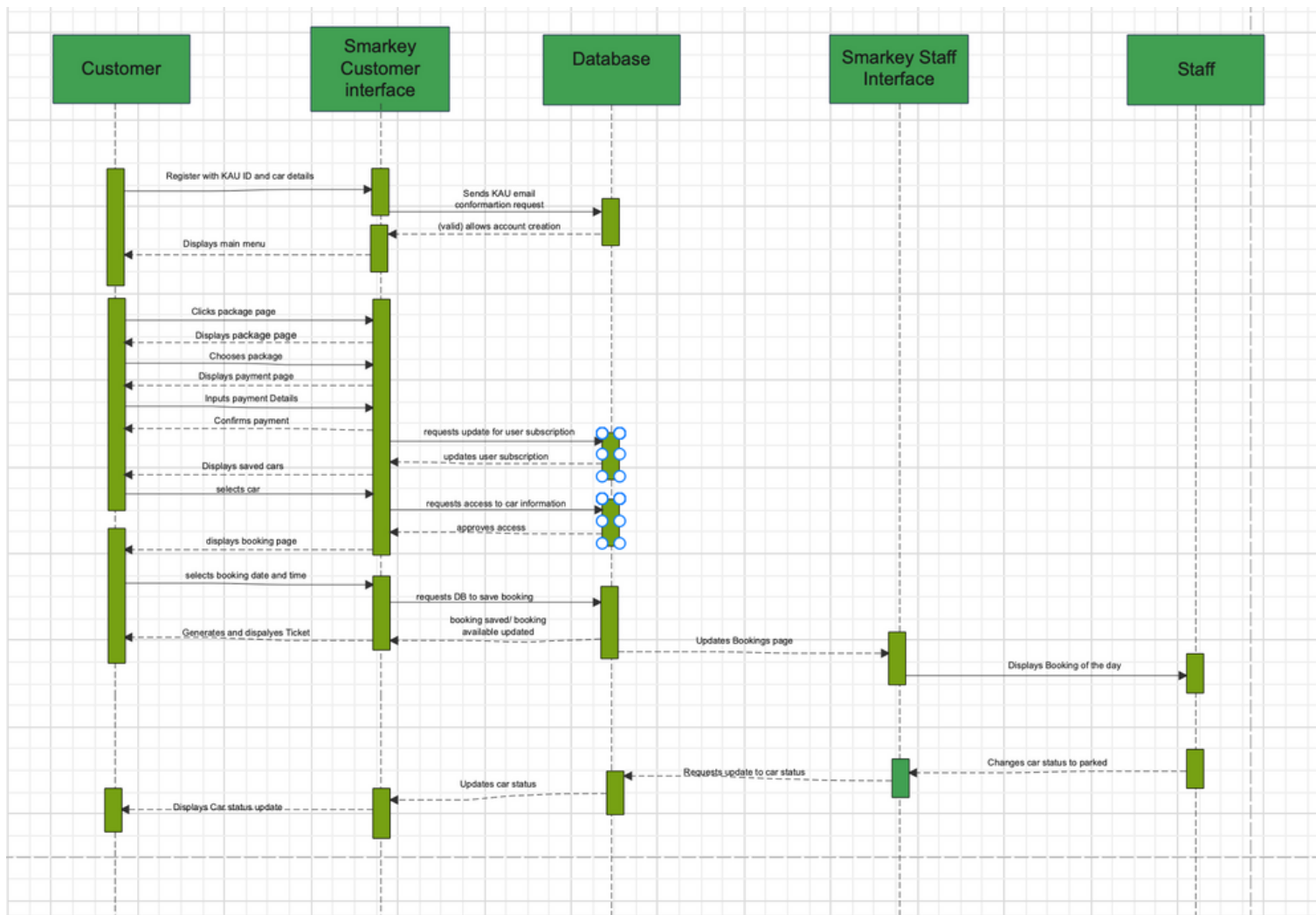


## **SYSTEM ARCHITECTURE**

---

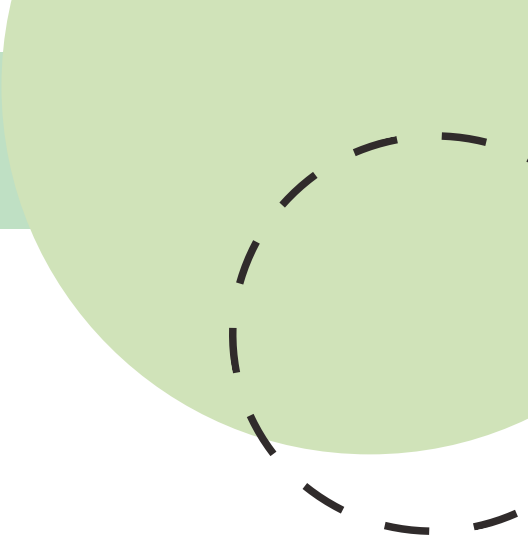
Our system is an Interactive System which is a computer system that characterized by significant amounts of interaction between humans and the computer. 3-tier Architectural Style is the most useable style, it organizes the system into three logical and physical computing tiers: the presentation tier, or user interface; the application tier, where data is processed; and the data tier, where the data associated with the system is stored and managed. This 3-tier Architecture Style provides many benefits: Improve the scalability, Faster development, Improve the security and Improve the reliability.

## SEQUENCE DIAGRAMS

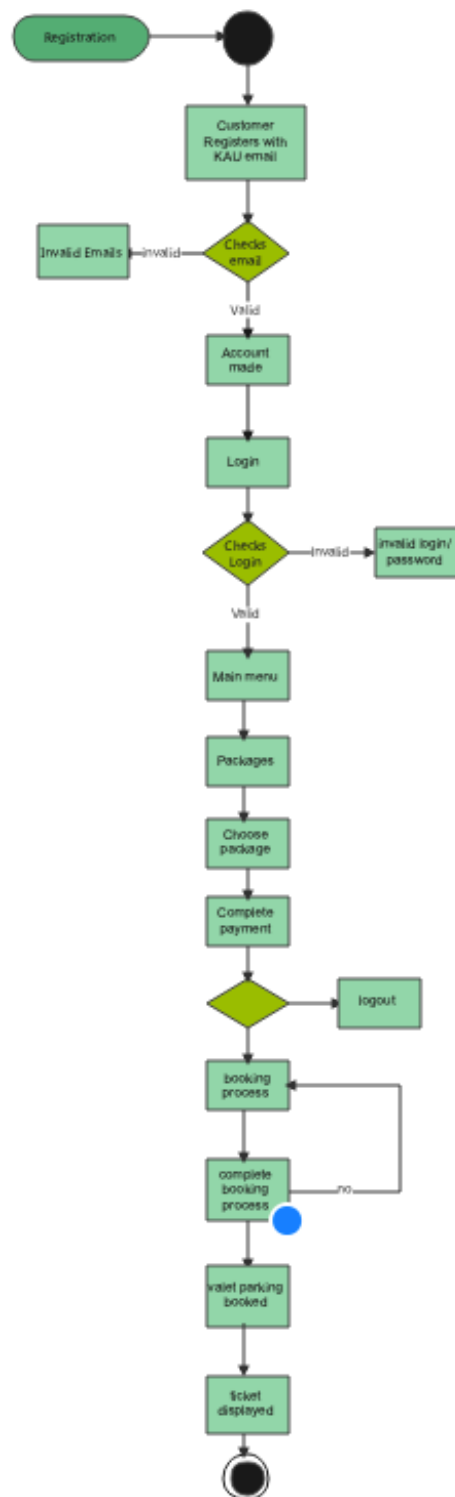


ACTIVITY DIAGRAM

---



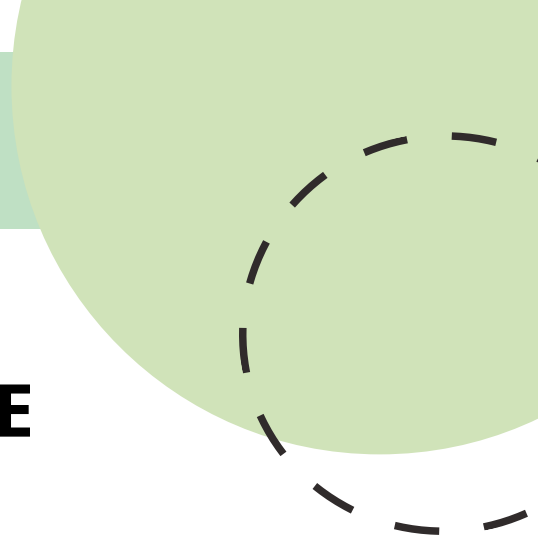
## STATE DIAGRAM



*SYSTEM IMPLEMENTATION*

## **USER INTERFACE PROTOTYPE**

---



## TEST PLAN AND TEST CASE

---

- Test plan purpose:

To ensure that the application performs as expected by the user and the staff and to ensure that the application serves its purpose without any complications.

- Scope:

Both functional and non-functional requirements are covered by the test plan. Our use case would be based on customer reservation. The customer must successfully book a parking by completing all the requirements.

- Type:

The tester must test every feature in the application to make sure everything goes as planned.



## TEST PLAN AND TEST CASE

---

### 1. Test case: Booking a Park

- Title:

Parking booking:

Success!

Parking confirmed, QR code will be available before parking time

- Description:

- The customer must be able to enter the application to book parking in the KAU desired department.

- Pre-condition:

All customers should have a KAU ID.

- Assumption:

It is being used with a supported (Application interface).

- Test steps:

1. The customer should sign-in or sign-up to Smarkey
2. The customer can then book a parking and recharge their balance
3. The customer chooses their subscription package
4. The customer pays for the package, and chooses the payment method
5. The customer chooses a parking time
6. The application displays the parking details

- Expected result:

In the booking purchase all information about the car and the park is displayed.

## TEST PLAN AND TEST CASE

---

### 2. Test case: Testing Transactions

- Title

You have successfully recharged your balance in Smarkey!

- Description

The user must not face any troubles while purchasing.

- Pre-condition

The user must sign-in to Smarkey successfully.

- Assumption:

The used payment method is supported by the application.

- Test Steps:

1. The user signs in and chooses the desired package.
2. The application takes the user to the payment page.
3. The four payment methods are displayed for the user to choose among them.
4. The customer pays the amount.
5. The transaction is successfully completed.

- Expected result:

The balance has been topped up successfully.