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NAME OF SYSTEM:	**CRS Rentals**

CRS Rentals

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Introduction

This project is designed to be used by Car Rental Company specializing in renting cars to customers. It is a system through which customers can view available cars, register, view profile and reserve a car. Nowadays, there is Online Car Rental, which benefits users greatly. A rental service is one where customers come to seek the rental of a rental unit. It is more convenient than paying for the unit's ownership and maintenance. A car rental company lends autos for a price for a few hours, a few days, or a week or more

Problem Statement

A car rental is a vehicle that can be used temporarily for a fee during a specified period. Getting a rental car helps people get around despite the fact they do not have access to their own personal vehicle or don't own a vehicle at all. The individual who needs a car must contact a rental car company and contract out for a vehicle. This system increases customer retention and simplify vehicle and staff management

Business Identified

The business identified is CRS Rentals, which is a company that deals with renting vehicles, located at Limpopo Province. CRS Rentals was established in 2020, and the founder of the company is Thuli Boshielo, a black businesswoman originally from Limpopo. The company is still small, and has only one office, which is headquartered in Praktiseer, Burgersfort, Limpopo

Document Overview

The document is structured in a way in which all the tools and designs of the system have been included. System Requirements, Object-Oriented approach diagrams

Purpose of the Document

The purpose of the document is to outline how the system was developed. It shows who the system was made for, what industry they are in, and show the Software Development Life Cycle of this system, from System Analysis, Design, Coding, Testing, Implementation and Maintenance

Who is written for?

The document is written for anyone who would like to know how this system was developed, and also to share some light into what is the system all about.

Purpose of the System

The advancement in Information Technology and internet penetration has greatly enhanced various business processes and communication between companies (services provider) and their customers of which car rental industry is not left out. This Car Rental System is developed to provide the following services:

- Enhance Business Processes: To be able to use internet technology to project the rental company to the global world instead of limiting their services to their local domain alone, thus increase their return on investment (ROI).

- Online Vehicle Reservation: A tools through which customers can reserve available cars online prior to their expected pick-up date or time.

- Customer's registration: A registration portal to hold customer's details, monitor their transaction and used same to offer better and improve services to them.

How it will fit into the operation procedures of the business

A car rental is a vehicle that can be used temporarily for a period of time with a fee. Renting a car assists people to get around even when they do not have access to their own personal vehicle or don't own a vehicle at all. The individual who wants to rent a car must first contact the car rental company for the desire vehicle. This can be done online. At this point, this person has to supply some information such as dates of rental, and type of car. After these details are worked out, the individual renting the car must present a valid Identification Card. Most companies throughout the industry make a profit based of the type of cars that are rented. The rental cars are categorized into economy, compact, compact premium, premium and luxury. And customers are free to choose any car of their choice based on their purse and availability of such car at the time of reservation.

Benefits & Goals

- The project's goal is to automate vehicle rental and reservation so that clients don't have to waste time calling and waiting for a vehicle.
- To convert the manual car rental procedure into a digital method.
- Specification (SRS) and Software Design Description.
- To ease customer's task whenever they need to rent a car
- It saves a lot of time, money, and labour
- Eco-friendly: The monitoring of the vehicle activity and the overall business becomes easy and includes the least of paperwork.
- The software acts as an office that is open 24/7.
- It increases the efficiency of the management at offering quality services to the customers.
- It provides custom features development and support with the software

System Overview & Functions Summary

This project covers a wide range of topics, from business concepts to computer science, and it necessitates the completion of numerous studies in order to meet the project's objectives.

Some of the topics covered include:
1. Vehicle rental industry - This covers research on how the car rental industry operates, the processes involved, and the potential for improvement.

2. The application was built using the C# programming language.

3. It uses a cloud database hosted on Microsoft Azure

4. Customers, as well as corporate employees, will be able to make good use of the system.

5. The platform implies that the system will be accessible 24 hours a day, seven days a week, with the exception of minor server outages.

Requirements regarding system access and security

Access: You will need to create an account, where the system will generate a password and send it to users' email address, and that will be used as a mean of email validation. The user has the ability of changing and resetting of their passwords

Security: The system provides a high level of security and integrity of the data held by the system, only authorized personnel of the company can gain access to the company's secured page on the system; and only users with valid password and username can login to view user's page. The users' passwords are not stored raw, they are hashed and salted, to ensure that in case of cyberattack, decryption of user's passwords will be difficult

Error handling: Errors are considerably minimized and an appropriate error message that guides the user to recover from an error are provided. Validation of user's input is highly essential. Also, the standard time taken to recover from an error is 15 to 20 seconds.

Factors that may affect the system

Network: The system uses a database which is hosted on a cloud, Microsoft Azure.

-> If you do not have internet connection, it will affect the system.

-> If somehow Microsoft Azure gets affected, it means the entire system will not be able to use the clou d database

Appendix

Questionnaires For Interview

System & Staff

1. How should the system be accessed?
2. How will the staff members be registered onto the system
3. What credentials should be used to login? (i.e Username and Password)?
4. Should perhaps staff members have staff codes? And how can we generate one?
5. What personal information will be stored in the database regarding staff?
6. Should staff member receive an email after being registered onto the system?
7. I have identified 3 users to the system, (Administrator, Manager & Agent), what are the privileges of each? (i.e What they can view, delete, update or edit)
8. Should staff details be deleted when no longer employed?
9. Should the system generate reports? If Yes, What kind of reports?
10. What is your preferred theme? Font Name, Colours & Size?
11. Which machine should the system be made for? (Web, Desktop or Mobile)?
12. Should the system have a Dashboard? If yes, what must be visible on the dashboard?

Vehicles

1. Who will be capturing vehicle details into the system? And what are those details?
2. How will the rental prices be set? Penalty charges?
3. How long can a customer rent a vehicle? (Days and Time)
4. Maximum number of vehicles a customer can rent?
5. Can vehicle details be updated when rented out?

Customers

1. How will a customer rent a vehicle? What is the procedure?
2. What personal information will be stored in the database regarding customer?
3. How will a customer pay for the costs?
4. Should a customer get an email on rental and on return with vehicle details and rental costs?
5. Should customer details be deleted after returning a vehicle?
6. How will customers give reviews?

Rentals

1. Should system keep rental history?
2. What details should be stored regarding rentals?

OVERALL

1. What happens if staff member forgets login password?
2. What should happen if email being sent doesn't go through?
3. Any other feature you would like to add to the system that I haven't mentioned?

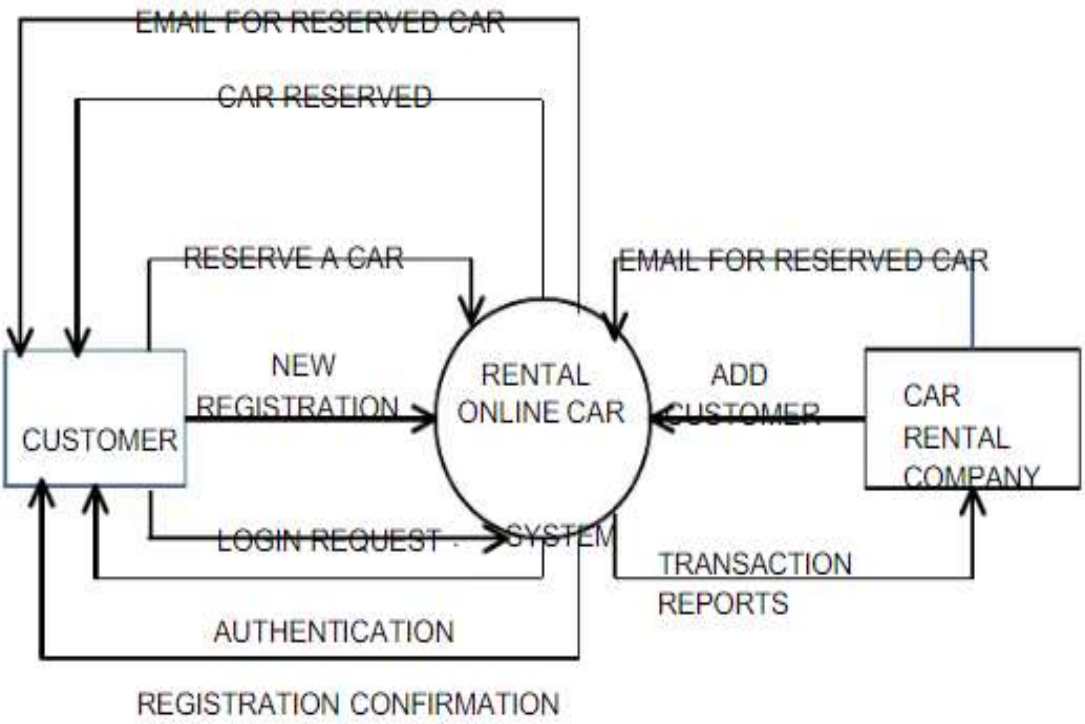
Outcomes

1. Project Name
   - **Car Rental System (CRS Rentals)**

2. **TABLES**
   - Staff
   - StaffLoginCredentials
   - Customers
   - CustomerLoginCredentials
   - Vehicles
   - VehiclesAvailability
   - Reservations
   - RentalHistory
   - SentEmails
   - BouncedEmails

Data Flow Diagrams

A Data Flow Diagram (DFD) is a graphical representation that depicts the information flow and the transforms that are applied as data moves from input to output.

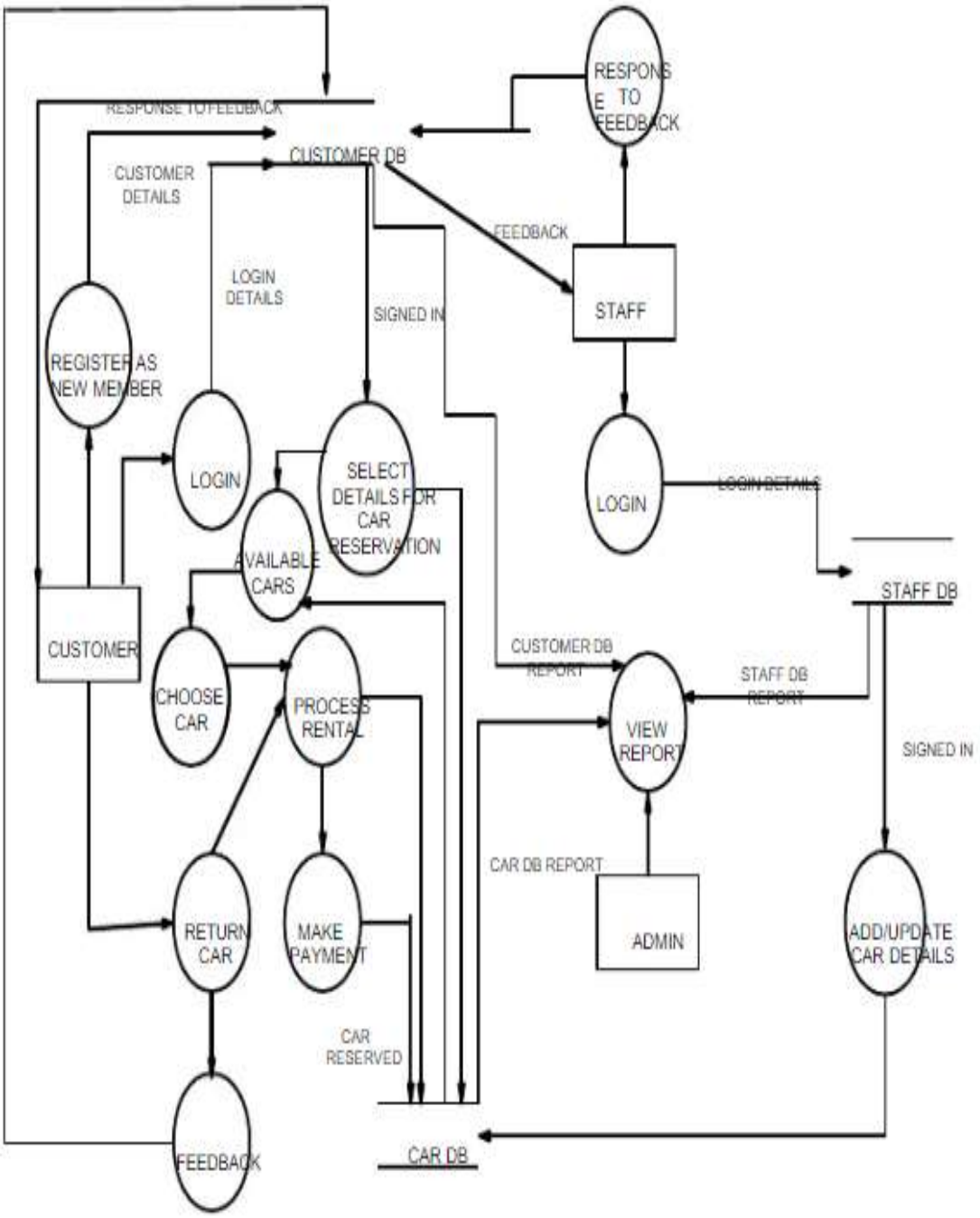


In this diagram, Customer and Car Rental Company are the two entity sets.
Functions of Customer:

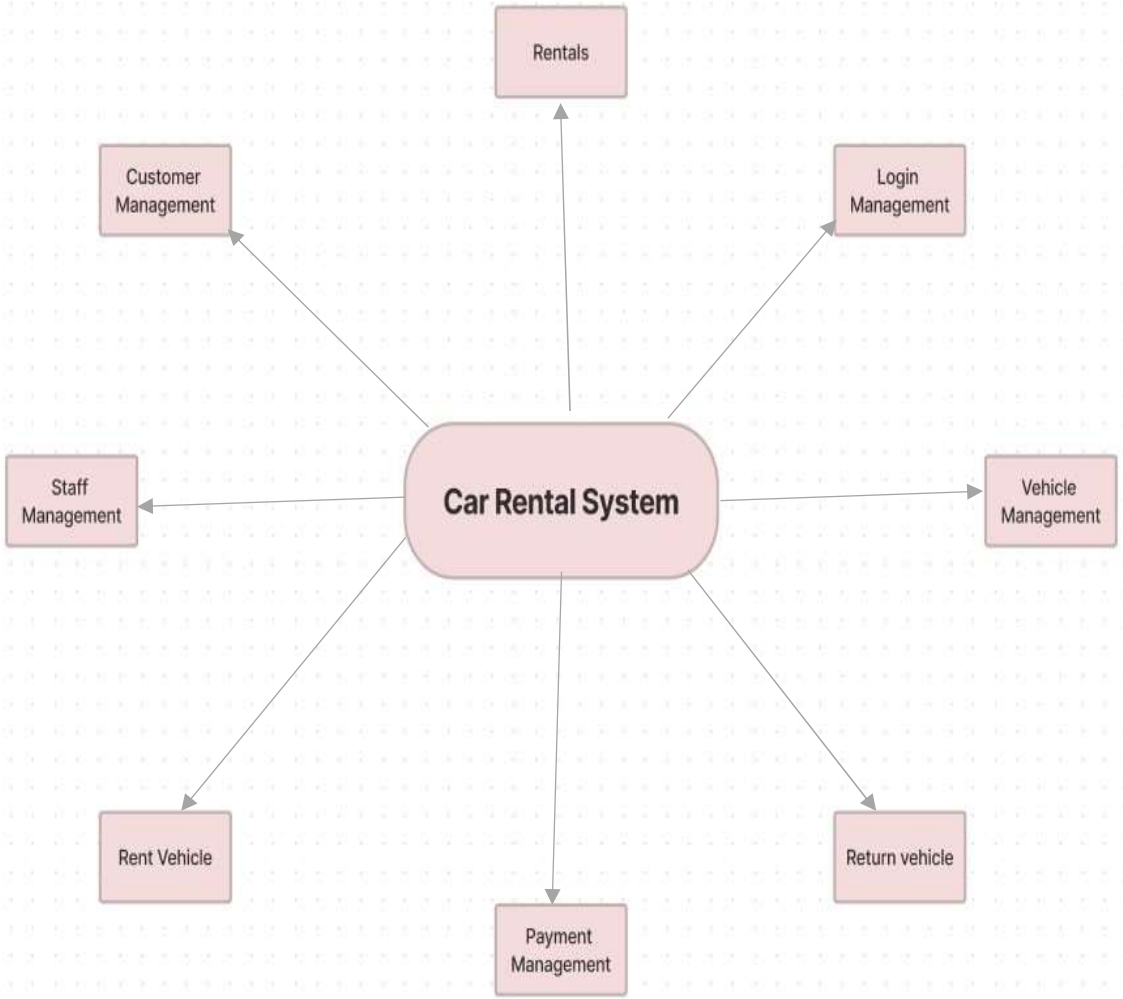
- New Registration
- Login Request
- Registration Confirmation by the System
- Reserve Car
- Email received for Reserved Car

Functions of Car Rental Company:

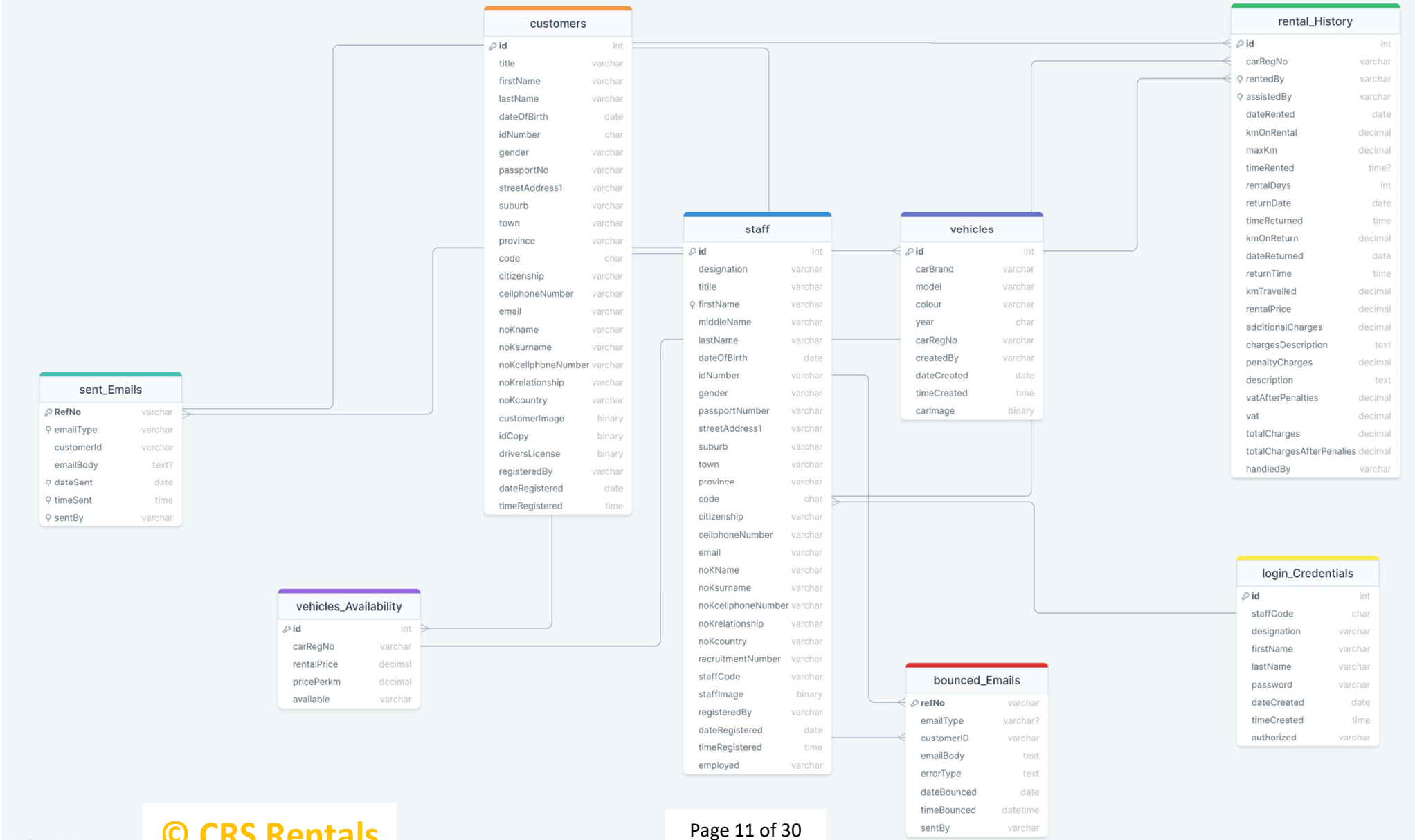
- Add Customer
- Send E-Mails for Reserved Car
- View Transaction reports


RESPONSE TO FEEDBACK
CUSTOMER DB
CUSTOMER DETAILS
FEEDBACK
LOGIN DETAILS
SIGNED IN
REGISTER AS NEW MEMBER
LOGIN
SELECT DETAILS FOR CAR RESERVATION
AVAILABLE CARS
CUSTOMER
CHOOSE CAR
PROCESS RENTAL
RETURN CAR
MAKE PAYMENT
CAR RESERVED
FEEDBACK
CAR DB
STAFF
LOGIN
LOGIN DETAILS
STAFF DB
CUSTOMER DB REPORT
STAFF DB REPORT
VIEW REPORT
SIGNED IN
CAR DB REPORT
ADMIN
ADD/UPDATE CAR DETAILS

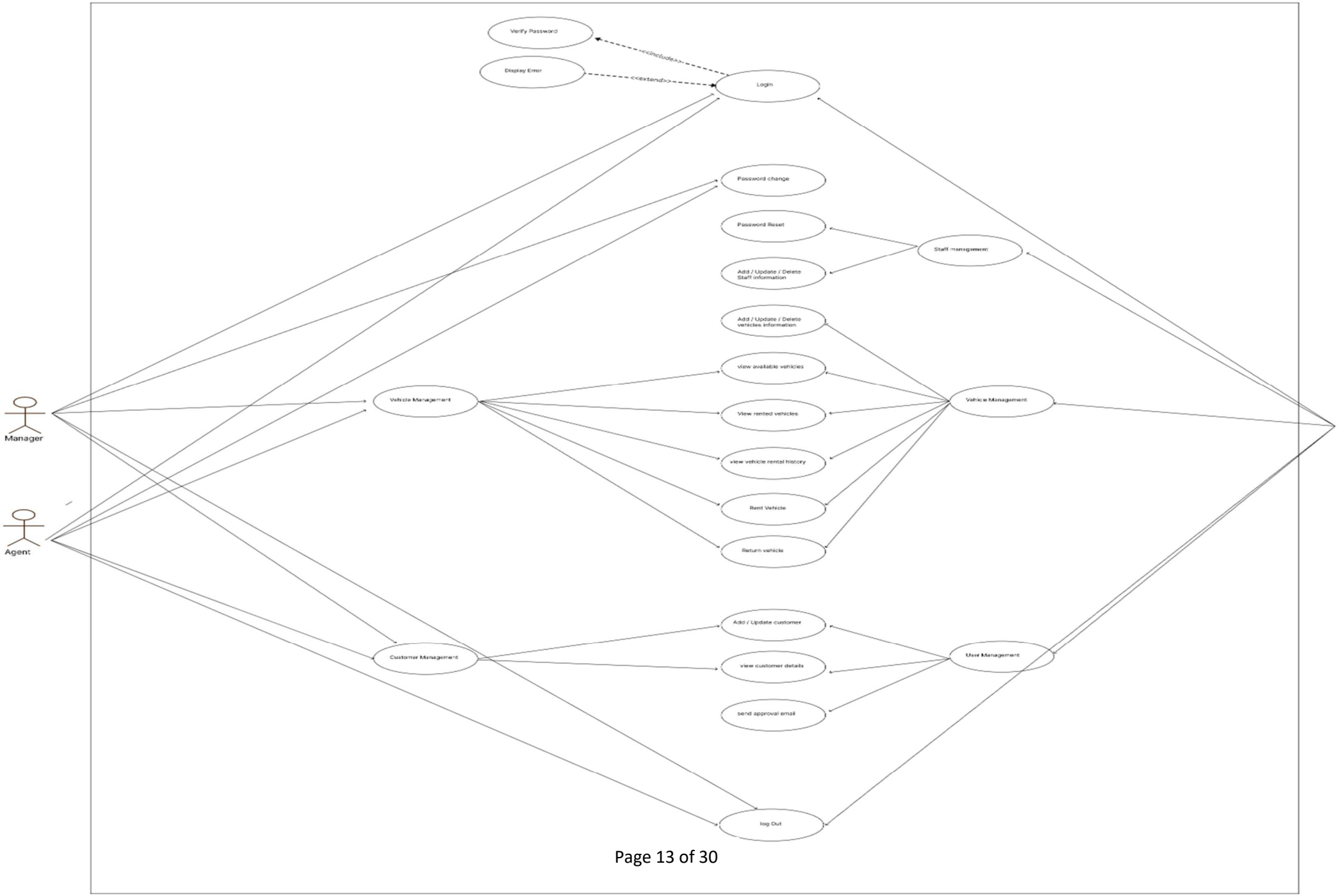
CONTEXT DIAGRAM



Entity Relationship Diagram



USE CASE DIAGRAM


Verify Password
<<include>>
Display Error
<<extend>>
Login
Password change
Password Reset
Staff management
Add / Update / Delete Staff information
Add / Update / Delete vehicles information
view available vehicles
Vehicle Management
View rented vehicles
Vehicle Management
view vehicle rental history
Rent Vehicle
Return vehicle
Manager
Agent
Add / Update customer
Customer Management
User Management
view customer details
send approval email
log Out

USE CASE DESCRIPTION

1. Login

This use case describes the activities of the user staff when attempting to login to the car rental system. The credentials of an Administrator, Manager, or Agent are required as part of the system login. The system then processes the login information. Access to the system is granted if the user has valid credentials. If not, the user is prompted to enter valid credentials again.

2. Staff management

2.1. Editing staff credentials

This use case describes the event in which Admin updates the details of staff (Manager and Agent) in the company's staff database. Specific privileges will be granted based on the staff credentials.

2.2 Adding staff

This use case describes the event by which Admin add new staff detail to the company's staff database. This includes the Manager and the Agent. It is invoked whenever a new staff join the company.

2.3 Password Reset

This use case describes the event by which Admin reset the staff login password in a case whereby the staff member forgot his / her password. The Admin replaces the staff password in the company's staff database. It is invoked whenever a staff has lost/forgotten their password.

2.4 Password change

This use case describes the event by which staff member changes his/her password. This will replace the user (Admin, Manager or Agents) password in the company's staff database. It is invoked whenever a staff member wants to change his/her password.

3. Vehicle management

3.1. Add New Vehicle

This use case is used by the Admin to add new car to the company's fleet database. Admin will need to login to activate this use case.

3.2 Edit / Change Vehicle Credentials

This use case is used by the Admin to edit and modify car details whenever there is new renewal (insurance, road tax). It allows the company to keep up-to-date record of their fleet.

3.3 View Available Vehicles

This use case allows the Admin, Manager, and Agent to search the database and retrieve vehicle information, such as vehicles available for lease, vehicle cost, and vehicle definition.

3.4 View Rented Vehicle

This use case allows the Admin, Manager, and Agent to search the database and retrieve vehicle information, such as vehicles that have been rented out, who leased them out, and when.

3.5 View Rental History

This use case enables the Admin & Manager to search the database and retrieve information about the vehicle, this includes who and when it was rented out. Rental history also includes how long the vehicle was rented out for. This allows the company to keep up-to-date record of their fleet.

3.6 Rent Vehicle

This use case enables the Admin, Manager and Agent to search and make reservations to lease out the vehicle. The staff need to be logged in to make such reservation. Once completed the vehicle is placed under “Rented Vehicles” and is no longer available for lease until brought back.

3.7 Return Vehicle

This use case describes the event of Agent, Admin or Manager returning the car borrowed, placing it back on the system. Once returned, the vehicle is placed under “Available Vehicles” and becomes available for lease.

4. Customer Management

4.1 Send approval emails to customers

This use case is used by the Admin to provide approval/feedbacks/comment to the users. A confirmation notification (Email) will be send to the customer after a successful transaction between the staff (Manager and Agent) and the customers.

4.2 Handle bounced emails

This use case is used by the Admin to handle all of the customer emails that have not been delivered. It provides the reason for the error and allows the Admin to fix any system faults.

4.3 Add Customer

This use case is used by the staff member (Admin, Manager or Agent) to register customer into the company's database of customers. The customer needs to provide the staff with Personal Information, Address Information, Next of Kin Information, Contact Information, and these attachments (ID Copy, Drivers License & Customer Image). Once details have been verified, customer is added to the database and rental process can begin.

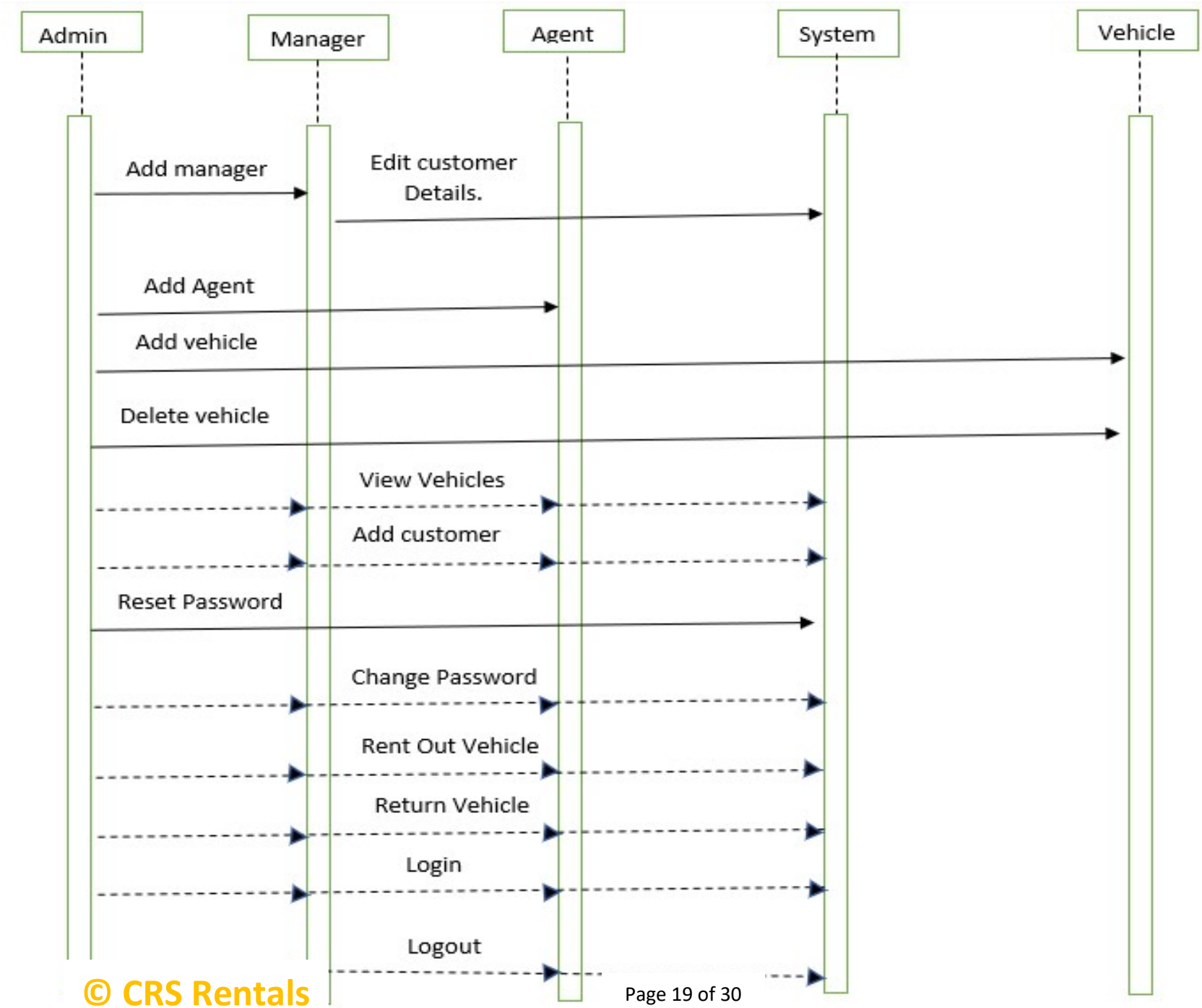
4.4 Edit / Update Customer Details

The Admin, Manager, and Agent use this use case to edit and modify customer details whenever they change. It enables the company to maintain an up-to-date record of their customer database. The use case allows for the altering and changing of previously stored data in the database.

5. Log Out

This use case enables the Admin, Manager and Agent to exit the system.

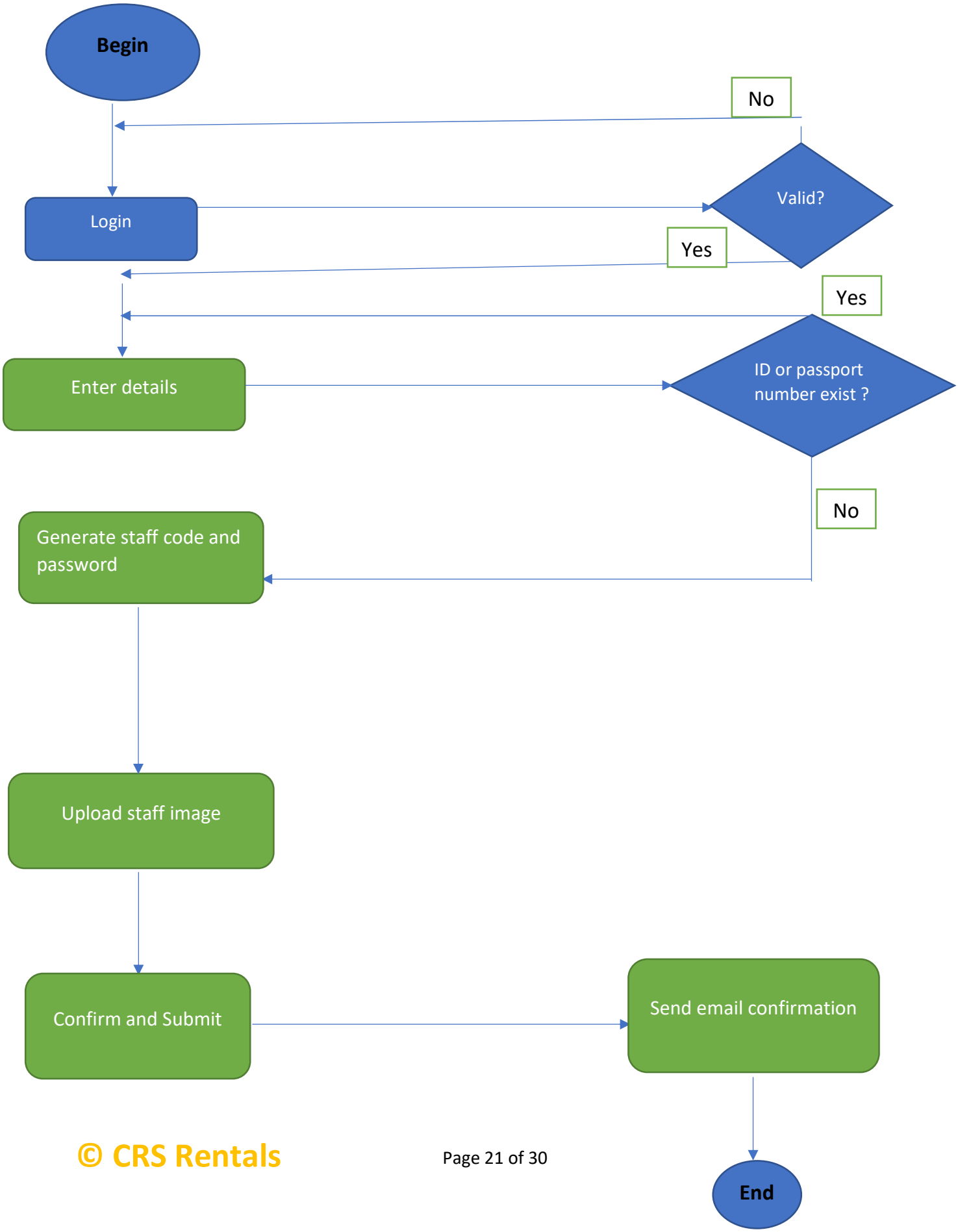
SYSTEM SEQUENCE DIAGRAM


Admin
Manager
Agent
System
Vehicle
Add manager
Edit customer Details.
Add Agent
Add vehicle
Delete vehicle
View Vehicles
Add customer
Reset Password
Change Password
Rent Out Vehicle
Return Vehicle
Login
Logout

ACTIVITY DIAGRAMS

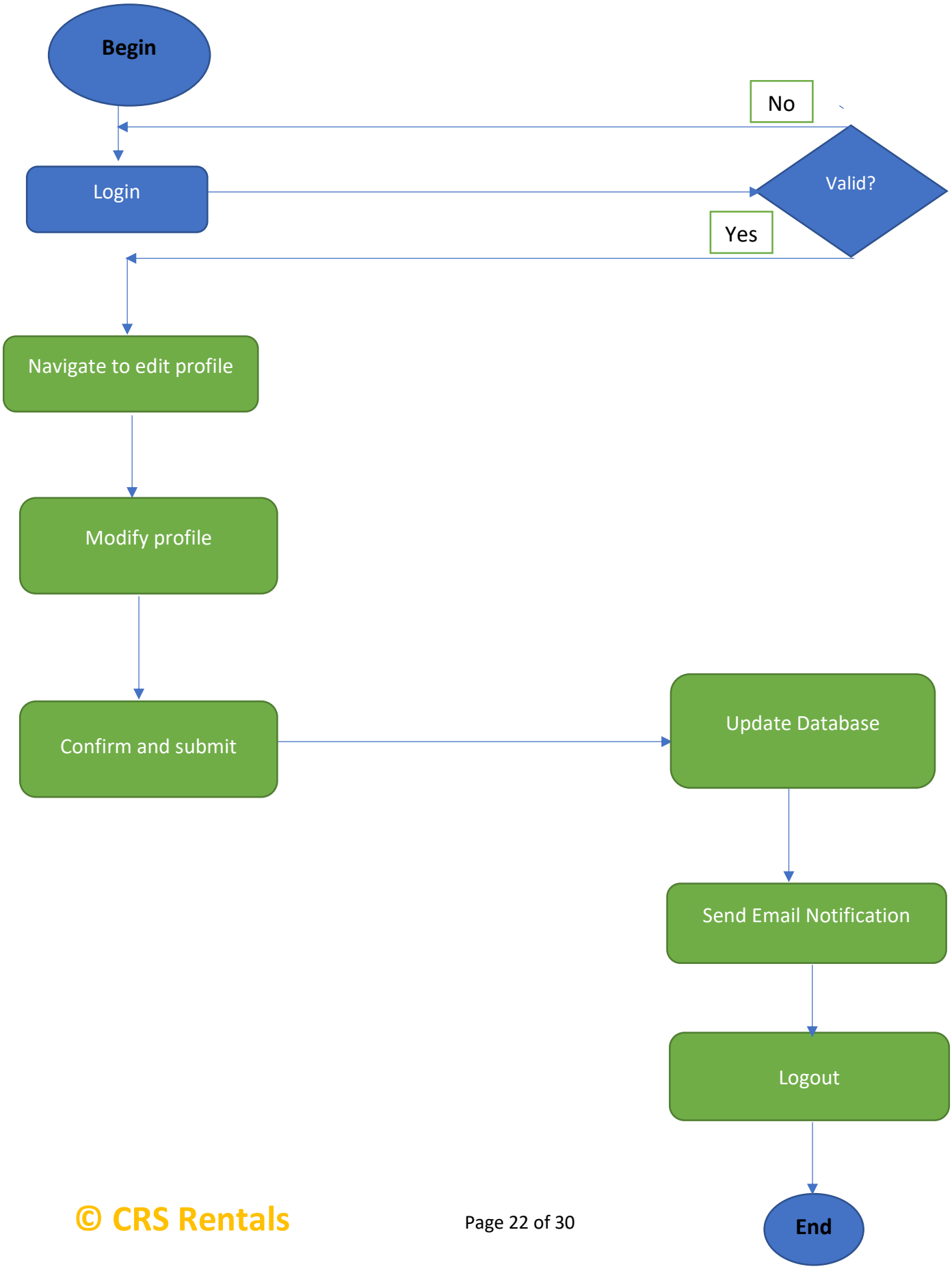
1. Staff Registration

Admin start



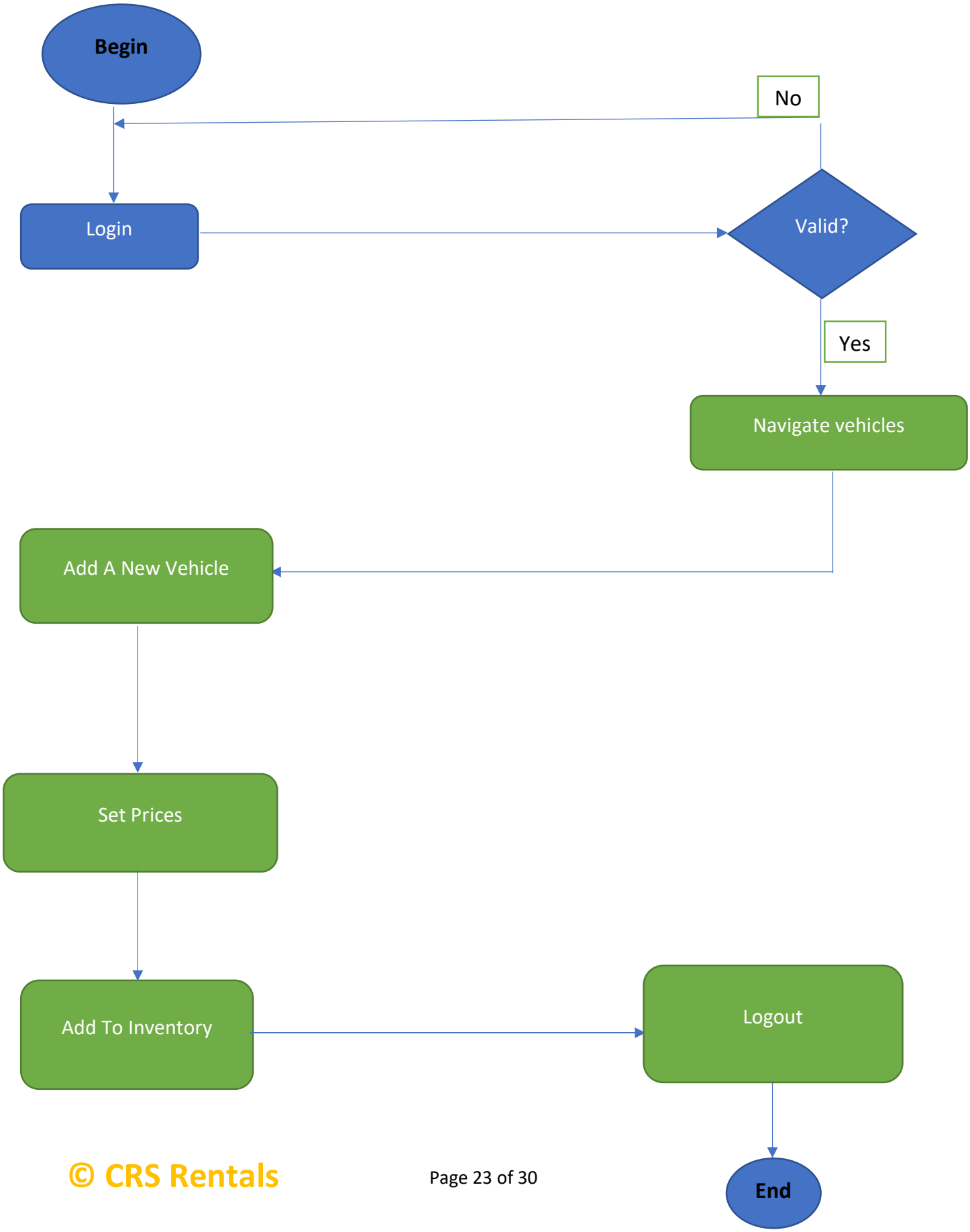
2. Staff Profile Modification

Admin Start



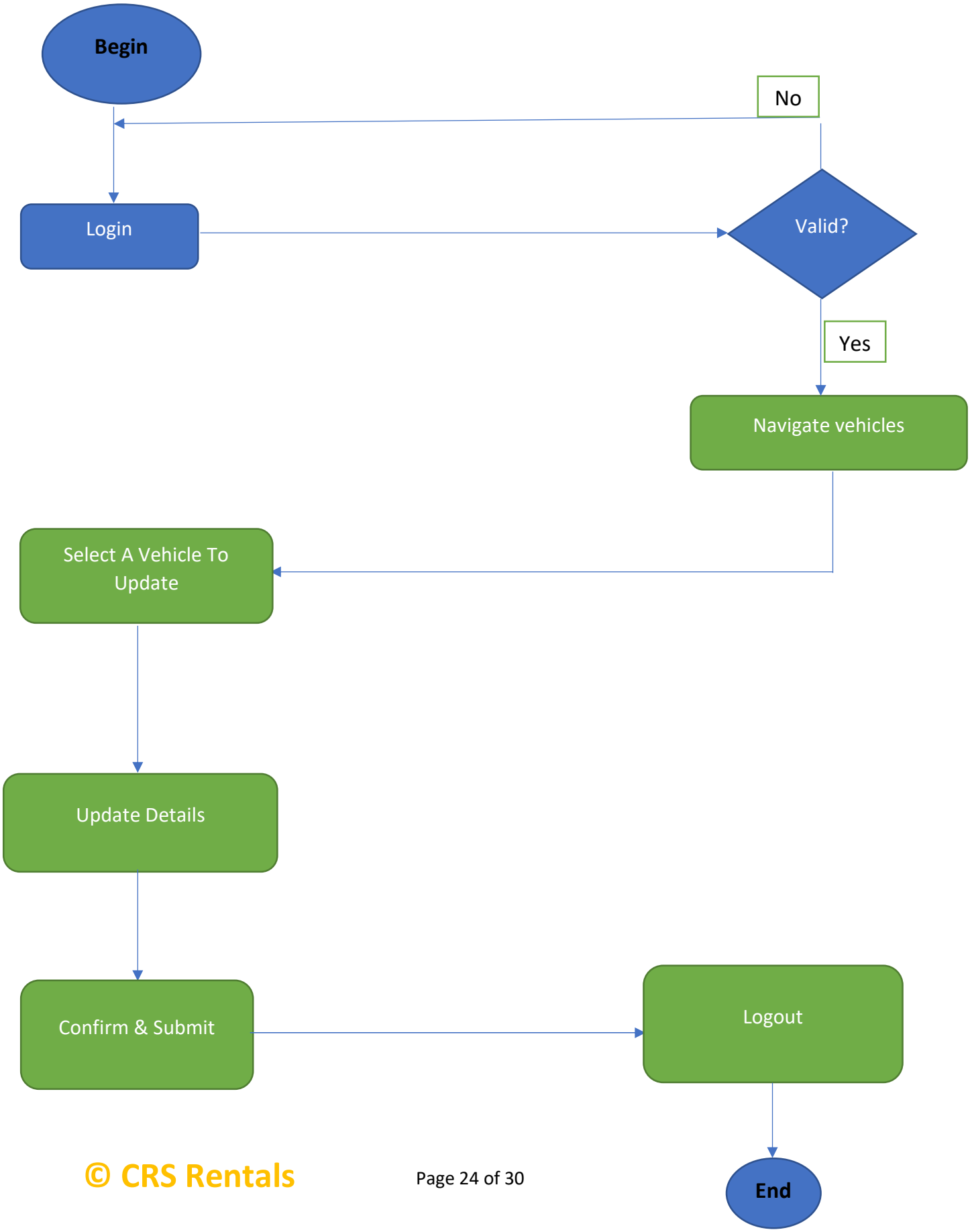
3. Adding A New Vehicle

Admin start



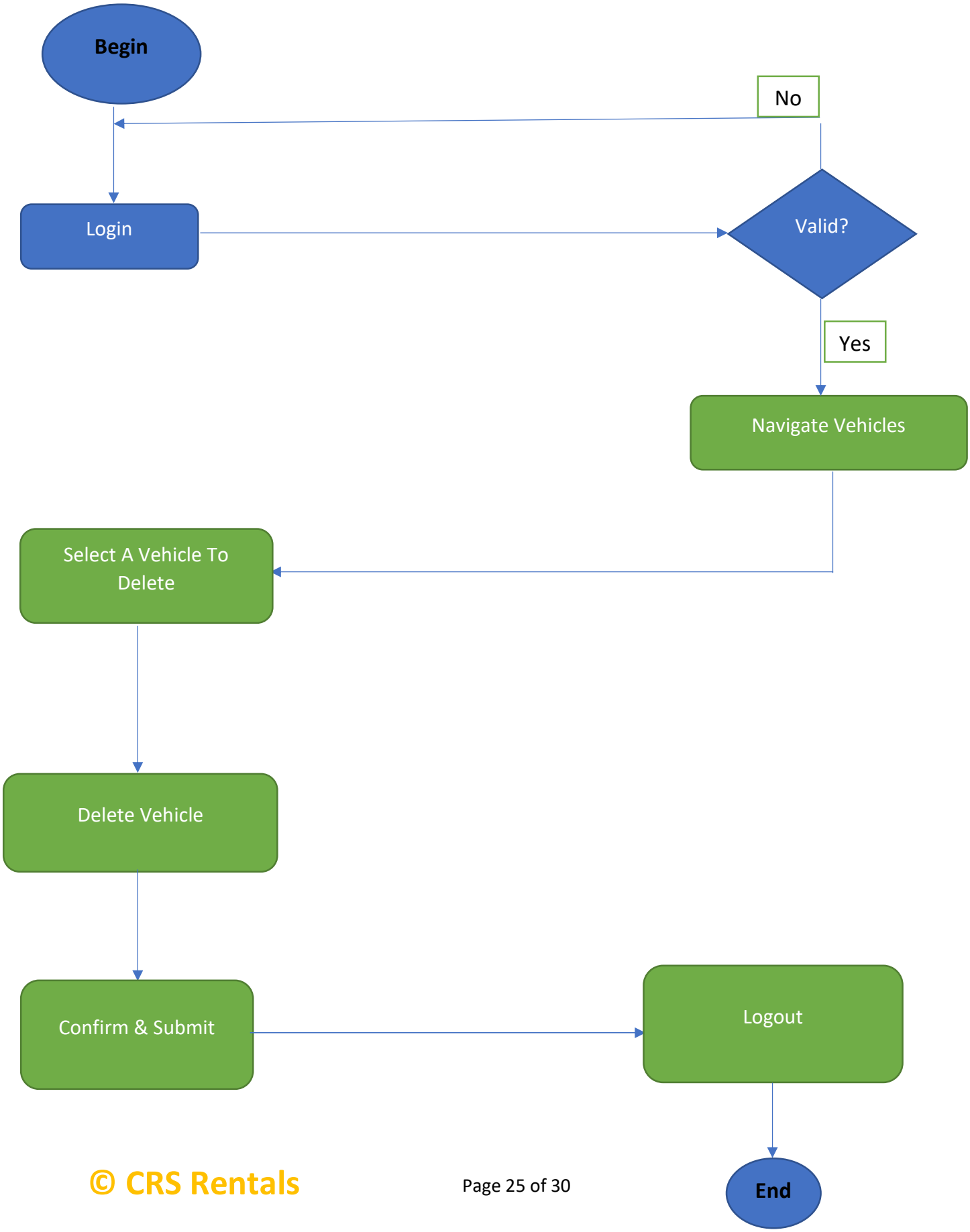
4. Update Vehicle Details

Admin start



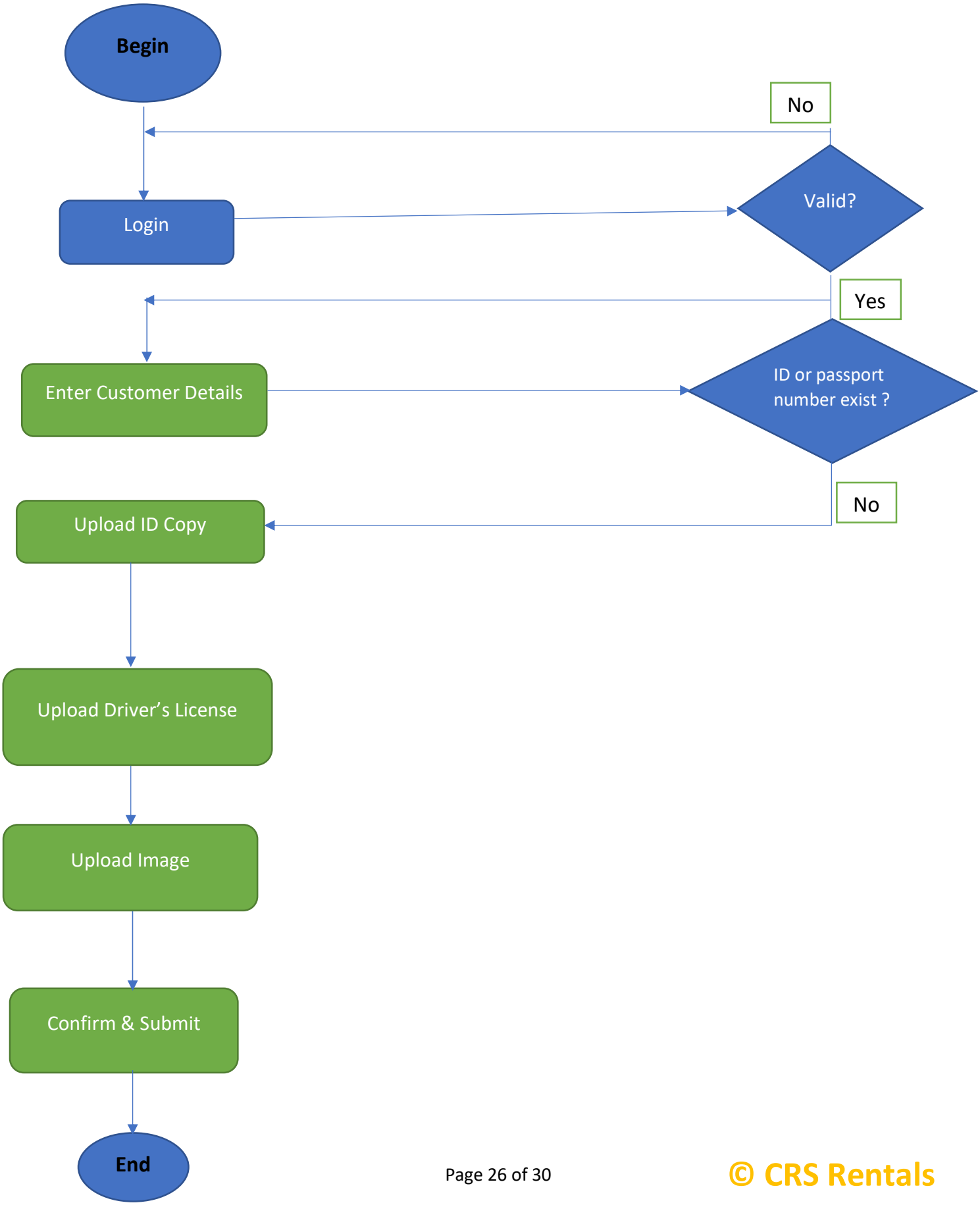
5. Delete A Vehicle

Admin start



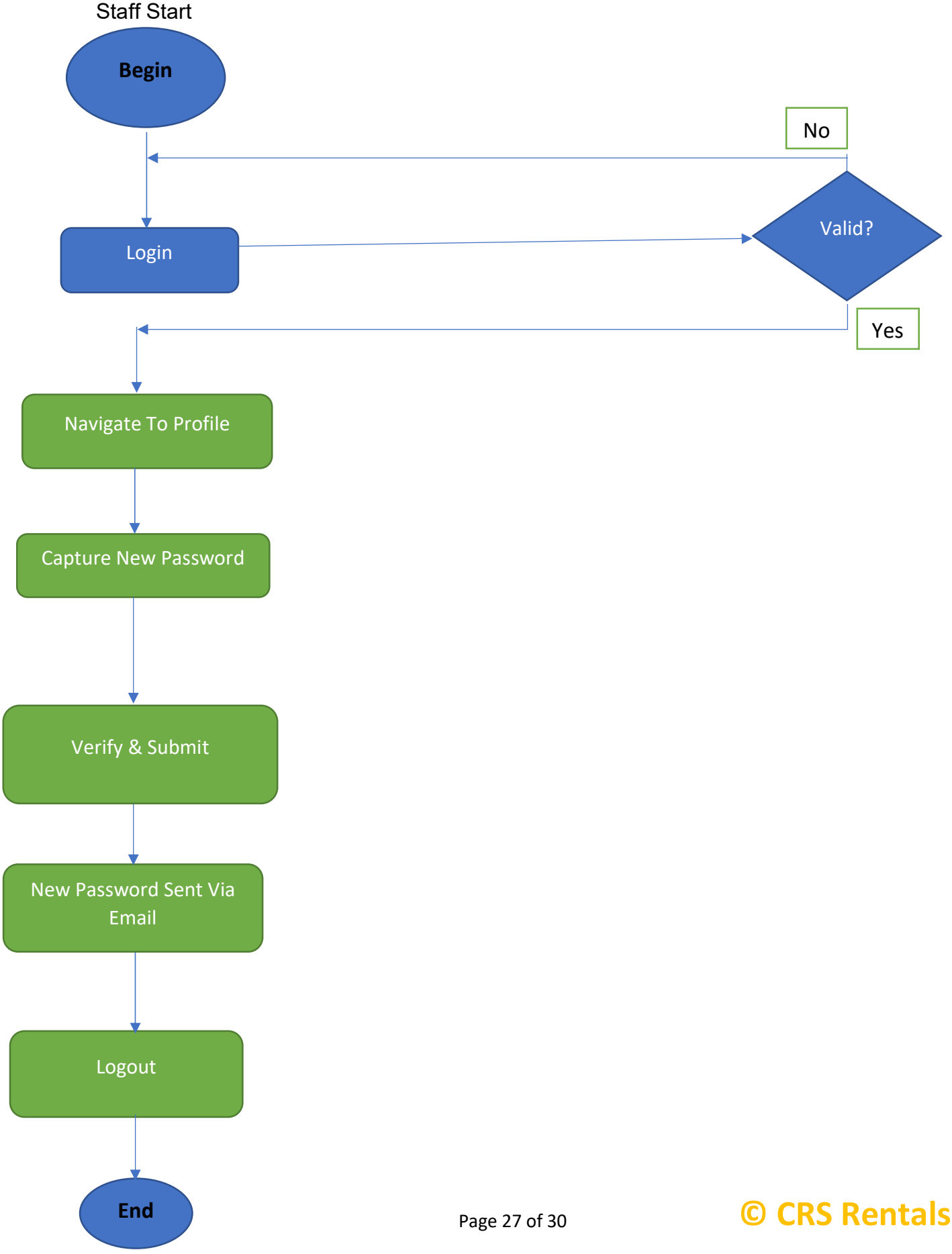
6. Customer Registration

Staff Start



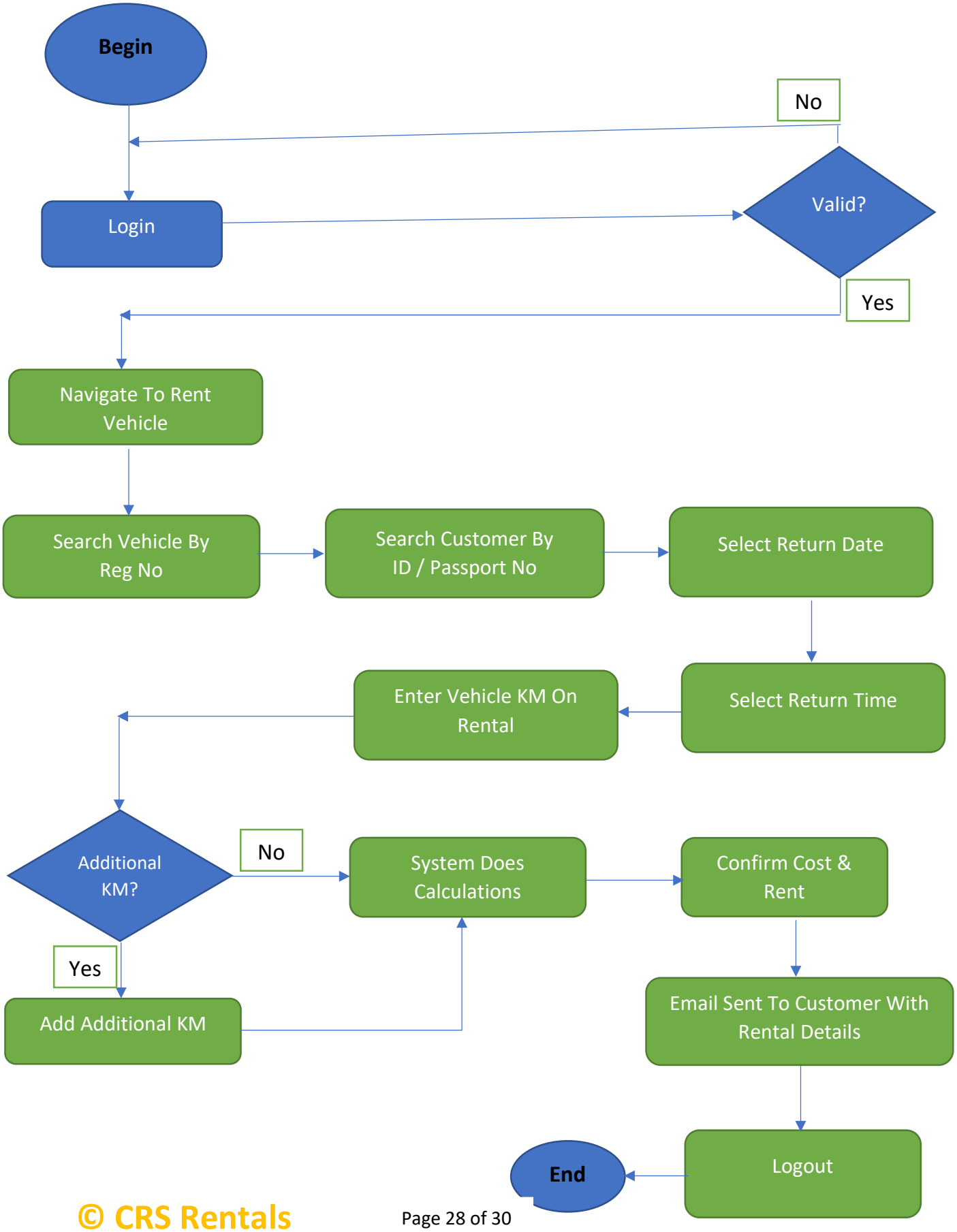
7. Change Password

Staff Start



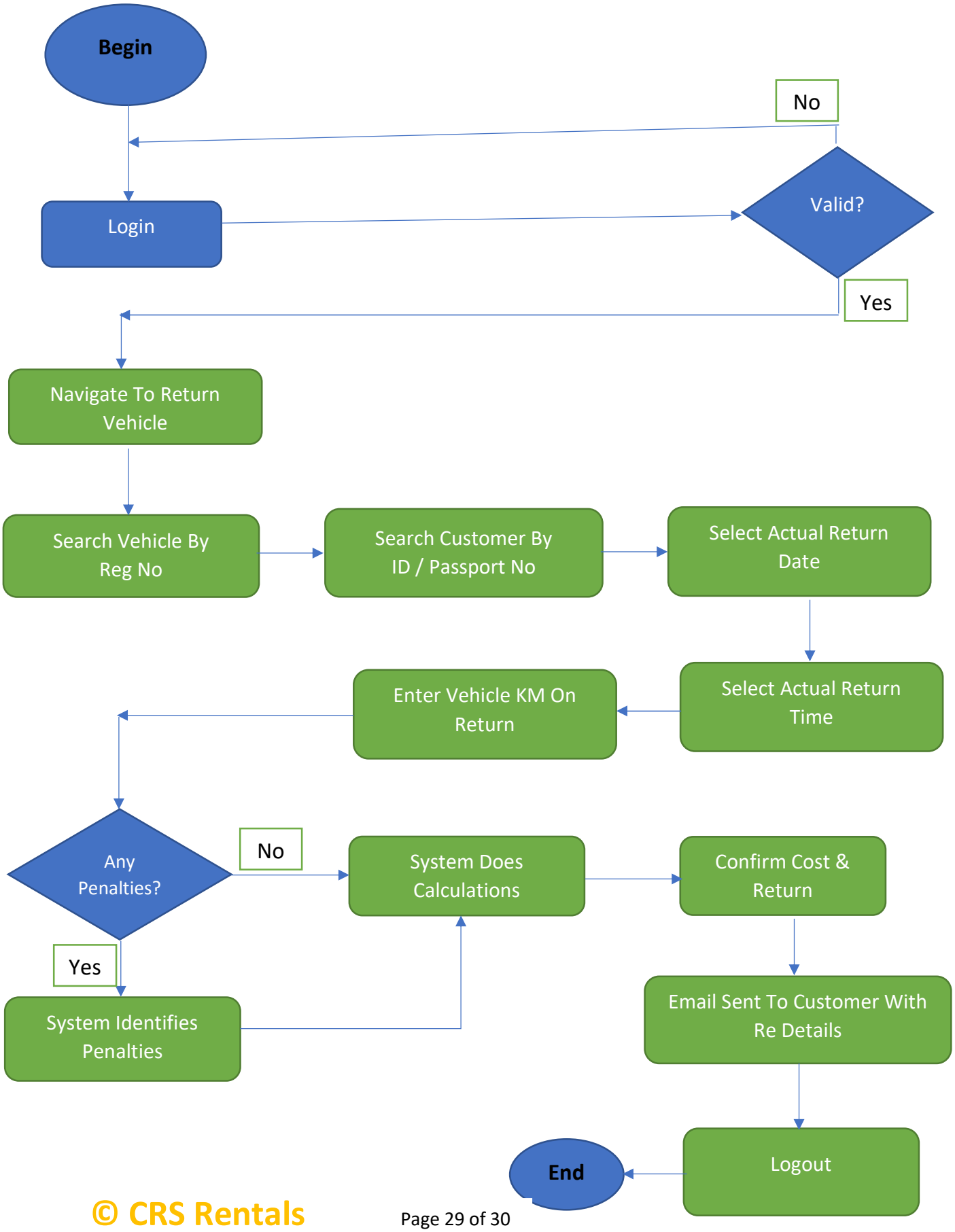
8. Vehicle Rental

Staff Start



8. Vehicle Return

Staff Start



Conclusion

Nowadays, there is Online Car Rental, which greatly benefits users. A rental service is one in which customers come to rent a vehicle. It is more convenient than paying for the ownership and maintenance of the vehicles. CSR Rentals provides vehicles for a fee for a few hours, a few days, a week, or more.

Customers will be able to reserve vehicles from anywhere in the world using the Car Rental System. Consumers can provide information to this application by filling out their personal information. After creating an account on the CRS Rental Customer Software, a customer can reserve a vehicle. The proposed system is an all-in-one system based on a cloud database. Manual processes are carried out as effectively and efficiently as possible by the CRS Rentals Admin, Managers and Agents