# SMART CAR RENTAL PORTAL

by

**KOMAL VENUGOPAL-17BCE0902**

**S BHANU PRAKASH-17BCE0143**

A project report submitted to

**Dr. GOPINATH M. P**

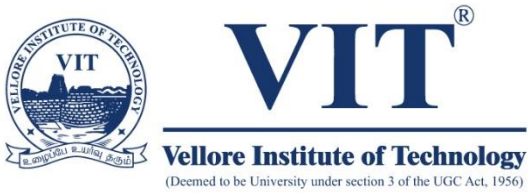
**SCHOOL OF Computer Science and Engineering**

in partial fulfilment of the requirements for the course of

**CSE4015–Human Computer Interaction**

in

**B.Tech. (Computer Science and Engineering)**




**VELLORE**

**NOVEMBER 2019**

## Introduction

We have chosen to produce a Car Rental system. In our system, Customer can rent a carbased on make and a model. Our system provides customer to have different pick-up and dropoff locations and will impose late fee if the rental car is returned beyond the return date and time. The Customers can purchase car rental insurance which is optional and can use upto one discount coupon to their final bill. Customers who have membership will be by default given a 10% discount in their final bill. We will see detailed description below.

## Motivation of the Project

With this company in need of a better system, we felt it was our obligation to help them in their time of need. To develop such a system that would not only ease the burden on the company's customers, but the company itself. Our team has an immense amount of knowledge when it comes to problem solving, programming, and communication. Not only would we strive to give the car rental service everything they desired, but we will continue to make sure the software is at its very best and beyond. Each one of us will always and will continue to give 100% and more to making the transition a breeze for the car rental service.

Our developer and team leader Jon brings to the project mass amount of web programming. His expertise will coincide with our visual designer and project manager expert, Katie, whom has experience with databases, web programming, as well as mobile programming. Also, having multiple heads working on the programming abilities helps in ensuring no errors are implemented and every single detail is put into place. Everything is wrapped up together with our project relations expert and co-manager Nick. With his experience with planning and monitoring the team, he ensures that no step is missed right from the design of the software to testing and software management.

## Requirements

a) Car rental agency should have collection of cars.

b) Each car should belong to a particular Car Category and each car will belong to a particular location.

c) Customer, based on his location and car category preferences, rents a car.

d) Based on his location and car category preferences, list of cars available to rent will be shown along with available date and time (from and to).

e) Customer will select a car from the suggestions and should be able to reserve it for rent.

f) When a customer reserves a car, he/she should be able to optionally purchase a Car Insurance Plan and should be able to apply at most one discount code.

g) If a customer is also a member of the car rental agency and has a membership ID then he/she will be given a default 10% discount in additional to the discount code applied. Therefore the total discount percentage will be 10 plus the discount percentage given by the discount code applied.

h) Billing is generated when a car is returned. i) Customer can return the car before the due date, on the due date or he/she can return it late also.

j)If a customer returns a car after the due date, additional late fee is calculated and added to the bill.

k) A default 8.25% tax is applied on the amount which also includes the late fee and this tax is added to obtain the total amount to which the discount will be applied and a final amount is obtained.

l) Once the car is returned it becomes available for the booking. m) A booking can be cancelled until 5 days before the actual pick up.

n) Company may have several discount plans like weekend discount, corporate discount etc.

o) Car price will be calculated based on the selected make and model.

**Entities**

a) Customer: Customer will be the one who is using car rental system for reserving a car. He can be a member of the system or a non-member of the system. Member of the system will have membership id. Customer entity will store details like customer driving license number, email, address, name, and phone number.

b) Car: Car entity will have list of cars available in the system. Each car will be associated with a car category and car will have attributes like make, model, mileage and registration number. Car will also have separate flag to check the availability of the car.

C) Car Category: Every car has a car category. Price is calculated based on the car category. Car category will have attributes like no of person, no of luggage's, name, and cost per day and late fee per hour.

d) Location :Location entity here denotes the pickup and drop off location of the car. Customer can pick up the car from the particular location and can have same or different drop off location. Location will have attributes like Location id, name and address.

e) Booking Each car reservation will be monitored in the entity called booking. Booking will have attributes like booking id, from date and time of booking and due return date and time and actual return date and time of the booking, and booking status. This booking amount might also include rental insurance and discount code.

f) Billing: When a customer returns a car, a bill will be generated on the particular booking. Billing have attributes like Bill ID, bill date, bill status, total late fee, tax amount, and total amount.

g) Discount Customer can apply discount code while the bill is generated. Each discount code has different discount percentage. Discount will have attributes like discount code, name, expiry date and discount percentage.

h) Car Rental Insurance Customer may already have car rental insurance or can buy one while booking the car. Car rental insurance will have attributes like insurance code, coverage type, name and cost per day.

**Relations**

a) Car to Car Category: Every car is associated with a car category. Once customer selects a car, the

cost per day is obtained from the car category that the selected car belongs to. The relation name is 'Belongs to'.

b) Car to Location: Customer will be picking up or dropping the car in a particular location.

Customer can pick up or drop-off the car at the particular location. So, cars will be present at a location. The relation name is 'Current location'

c) Booking to Billing: Once customer returns a car bill will be generated for each booking. There can

be case like booking is cancelled in that case no bill will be associated with the booking. The relation name is 'Gives'.

d) Booking to Discount: Customer may apply a discount code when he/she books a car. This discount

will be applied to the total amount after tax and late fee while the bill is generated. Based on the discount code total amount will be reduced by some percentage. The relation name is 'Has'.

e) Booking to Car Rental Insurance: Customer can select rental insurance while booking a car so that rental

insurance will cover damages based on the coverage type. The relation name is 'Includes'.

f) Booking to Location: Customer can pick a car for rent from a particular location. The relation name is

'Pick up location'.

g) Booking to Location: Customer can drop off rental car in a particular location. The relation name is

‘Drop off location’.

h) Customer to Car to Booking: Customer will select car for rent. So the customer will be related to the both car and the booking. The relation between these 3 entities is a ternary relation and the relation name is ‘Rents’.

I) Booking to Discount: Customer may apply a discount code when he/she books a car. This discount

will be applied to the total amount after tax and late fee while the bill is generated. Based on the discount code total amount will be reduced by some percentage. The relation name is ‘Has’.

**Assumptions**

a) Each booking is associated with only one car reservation at a time.

b) Car available in the system should be present at some location.

c) Billing may or may not have discount code applied.

d) Not all Booking is associated with billing because of the cancelled bookings.

e) Booking may or may not have rental insurance because customer may have his own insurance.

**Requirements**

Hardware Requirements:

The software should be ran on any sort of desktop or laptop environment, regardless of the operating system. The software also has the potential of running on tablets, but with a more simplified version. Essential input/output devices are keyboards, mouse, and printers; nothing else is required but can be recommended if desired.

Performance Requirements:

- Ability to maintain mass amount of customers on the website at once without crashing
- Speedy performance / transmission of data
- Send any emails immediately
- Being logged in should allow for customers to quickly make payments without reentering information, and allow for any potential registered perks the company may have.
- Have a quick recovery time if anything were to go wrong
- Display accurately and efficiently on all devices (responsive view)

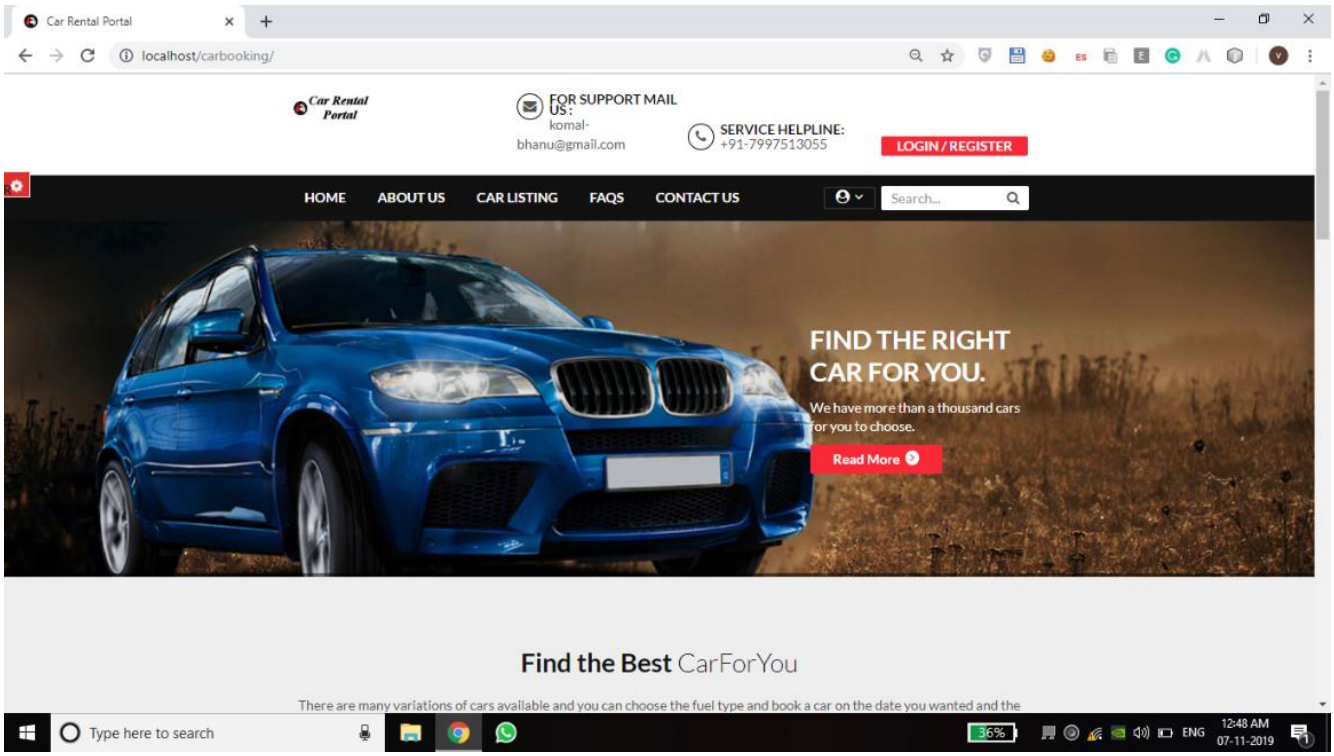
Security Requirements:

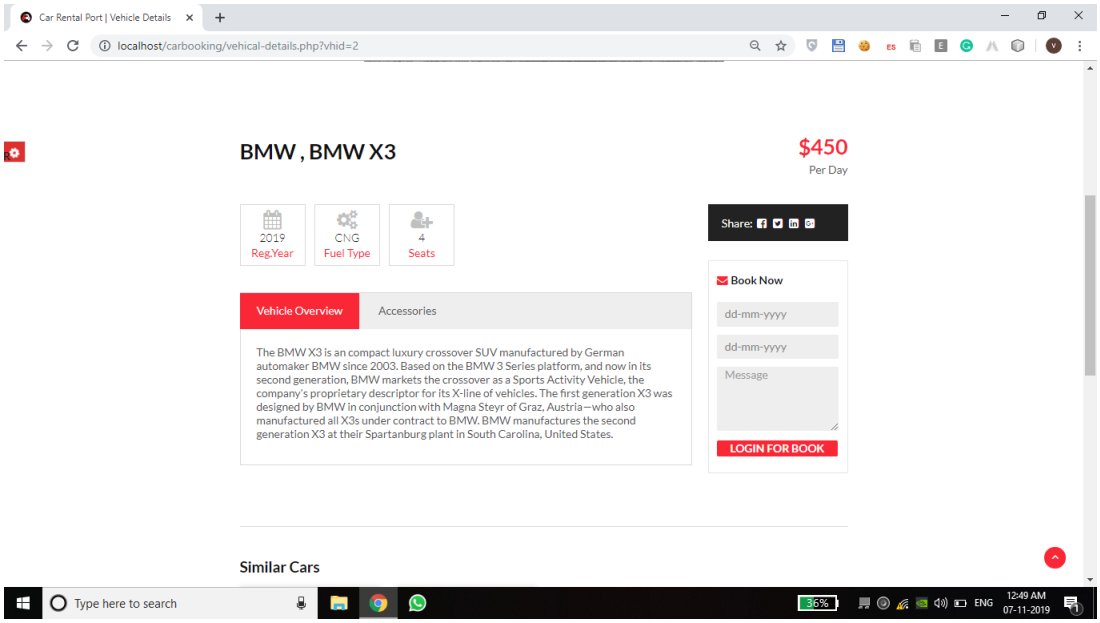
- Secure any transmissions of private information between the customer and the company
- Prevent any potential threats such as SQL injections through the forms or search boxes.
- Prevent third party users at administration level
- Verify website security certificates (that lock in the address bar)
- Prevent false information from being used as payment
- Prevent false email inputs from being used when registering

Quality Attributes:

- Maintain a user friendly environment that is visually appealing
- Easy to see and use navigation
- Maintain readable content
- Searching cars should be accessible to people who are and are not logged in
- Selecting and making a payment should be available to customers who are and are not logged in

**Output**




Car Rental Port | Vehicle Details
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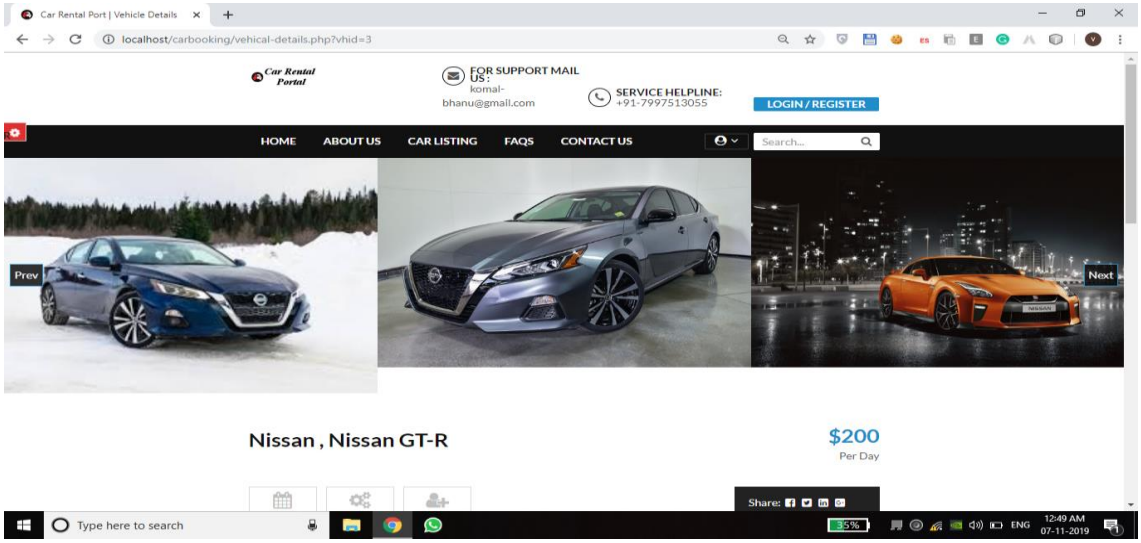
BMW , BMW X3
$450
Per Day
2019
Reg.Year
CNG
Fuel Type
4
Seats
Share:
Book Now
dd-mm-yyyy
dd-mm-yyyy
Message
LOGIN FOR BOOK
Vehicle Overview
Accessories
The BMW X3 is an compact luxury crossover SUV manufactured by German automaker BMW since 2003. Based on the BMW 3 Series platform, and now in its second generation, BMW markets the crossover as a Sports Activity Vehicle, the company's proprietary descriptor for its X-line of vehicles. The first generation X3 was designed by BMW in conjunction with Magna Steyr of Graz, Austria—who also manufactured all X3s under contract to BMW. BMW manufactures the second generation X3 at their Spartanburg plant in South Carolina, United States.
Similar Cars
Type here to search
12:49 AM
07-11-2019


Car Rental Port | Vehicle Details
localhost/carbooking/vehical-details.php?vhid=3
Car Rental Portal
FOR SUPPORT MAIL US:
komal-bhanu@gmail.com
SERVICE HELPLINE:
+91-7997513055
LOGIN / REGISTER
HOME
ABOUT US
CAR LISTING
FAQS
CONTACT US
Search...
Prev
Next
Nissan , Nissan GT-R
$200
Per Day
Share:
Type here to search
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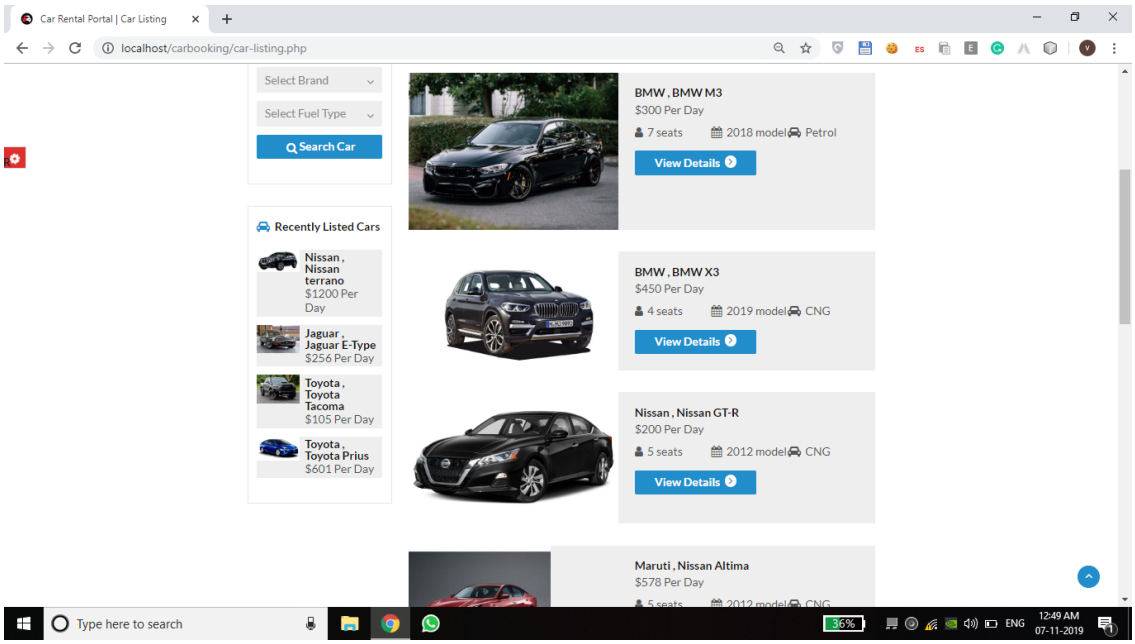
07-11-2019


Car Rental Portal | Car Listing
localhost/carbooking/car-listing.php
Select Brand
Select Fuel Type
Search Car
Recently Listed Cars
Nissan , Nissan terrano
$1200 Per Day
Jaguar , Jaguar E-Type
$256 Per Day
Toyota , Toyota Tacoma
$105 Per Day
Toyota , Toyota Prius
$601 Per Day
BMW , BMW M3
$300 Per Day
7 seats
2018 model
Petrol
View Details
BMW , BMW X3
$450 Per Day
4 seats
2019 model
CNG
View Details
Nissan , Nissan GT-R
$200 Per Day
5 seats
2012 model
CNG
View Details
Maruti , Nissan Altima
$578 Per Day
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## Conclusion

During the course of this project, we learnt a lot of the work and best practices that go into creating a database, the rules to construct a good ER diagram, How to come up with relational schema mapping from the ER diagram, deriving the functional dependencies and how to normalize the relational schema. We learnt on how to design a system from Database perspective and how to efficiently store and manipulate data.