

CAR RENTAL SYSTEM WITH E-COMMERCE  
TECHNOLOGY USING ZEND FRAMEWORK

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## **ABSTRACT**

Currently, the student finds a car to rent via social network and make some call to car's owner for a rent. To give the advantages for both owner and rental, the car rental system was developed. This project was done to overcome the problem of student to find a car to be easier and for the car's owner they can manage booking made by rental through this system. This system includes three modules which are of rental, car's owner and administrator. This project use Agile methodology to implement the development process and Zend Framework as a system architecture. For the project development, PHP language been used as a language and MYSQL as a database to store information.

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## **LIST OF ABBREVIATIONS**

<b>ABBREVIATION</b>	<b>TITLE</b>
CRS	Car Rental System
PHP	Hypertext Preprocessor
CSS	Cascading Style Sheets
SRS	Software Requirements Specification
ERD	Entity Relationship Diagram
ZF	Zend Framework
MVC	Model View Controller
SDD	Software Design Documentation



## **PART 1.1**

### **INTRODUCTION**

This chapter will provide a brief overview of the entire project including the objective of the project, scope, problem statement, and organization of the thesis.

#### **1.1.1 Introduction**

Car is a transportation used by human to go everywhere also across state by state, from home to the town and so on. It is become one of the most important things in our daily life.

For the among of workers, they able to buy a car and pay with the salary they have. But it is different with the student, who is fully study they don't able to buy a car like workers did. Just only a certain student that having their own car. In order to go out anywhere, student who doesn't have a car, they need to rent.

At the university, having many of student who own the car, manage to rent their car for others student. In order to rent, they need to post their advertisement to get customer. In a rental side, they need to find these ads to get car's owner phone number to make a call and then rent the car. The situation is, it is difficult for a rental to find those ads because the car owner posts their ads in a "Facebook" together with others ads.

In order to resolve this problem, a newly Car Rental System prototype will be developed based on some feature taken from various outside car rental system. This system will make both rental and car owner easy to do their business. All this will hopefully help both parties achieve their target at the same time.

### **1.1.2 Problem Statement**

For this project itself, they have several purposes to be considered. Nowadays, the need of vehicle as transportation becomes one of the important thing need to be considered because student who doesn't have the vehicle, they will facing the problem to go outside. When this problem came out, student need to find the vehicle to rent.

Commonly, the one who is rent the car is the UMP student itself but the rental who wants to rent those cars difficult to search car because they don't have any platform that serves a services like a web based system for car rental. As a way to solve this problem, this project will be develop in order to be as a platform for UMP student to find out whose car are under rent state. For the car's owner, they can register and post their car through this system, manage scheduling for each car for rental purpose. The rental, can find the car based on the time and date they want.

Before this, car's owner only post their car using the social network platform known as Facebook, but the problem is the post that have been posted about details car rental already disappeared due to the another advertisement post. For the rental, they

need to find out where is the advertisement about car located. As a result, it is hard for them to search those posted because another advertisement post already take over the place. For the car's management about scheduling, the owner using the online docs to list out who is booking their car. They don't have any specified platform to use.

### **1.1.3 Objectives**

The Objectives of the system developed are:

- I. To easier student in searching the cars based on date and time need to rent.
- II. To easier car's owner manage their cars and manage booking made by rental.
- III. To make car rental system as a platform for both rental and car's owner to find a car for rent and manage booking respectively.

### **1.1.4 Scope**

- I. This system focus on the UMP student for booking the vehicle.
- II. There have three of user :
  - Admin – The person who take care about the registration of another user and updating user details like deleting information.
  - Vehicle Owner - The person in charge to register their vehicle, accepting booking from booker and manage schedule for each of vehicle.
  - Booker – The person that responsible to book the vehicle.
- III. Tools :
  - Languages - Server Side Scripting (PHP Language), Client Side Scripting(Jquery framework)
  - Styling – CSS (Cascading Stylesheets)
  - Rendering – HTML (Hypertext Markup Language)
  - Database – MYSQL
  - Server - Apache

- IV. The methodology that will be used in the process of development this Car Rental System is Agile Methodology.

## **PART 1.2**

### **EXISTING SYSTEM**

This chapter will briefly explain about the existing system of Car Rental System. There will also a discussion of features that will be referred from other Car Rental System available in market.

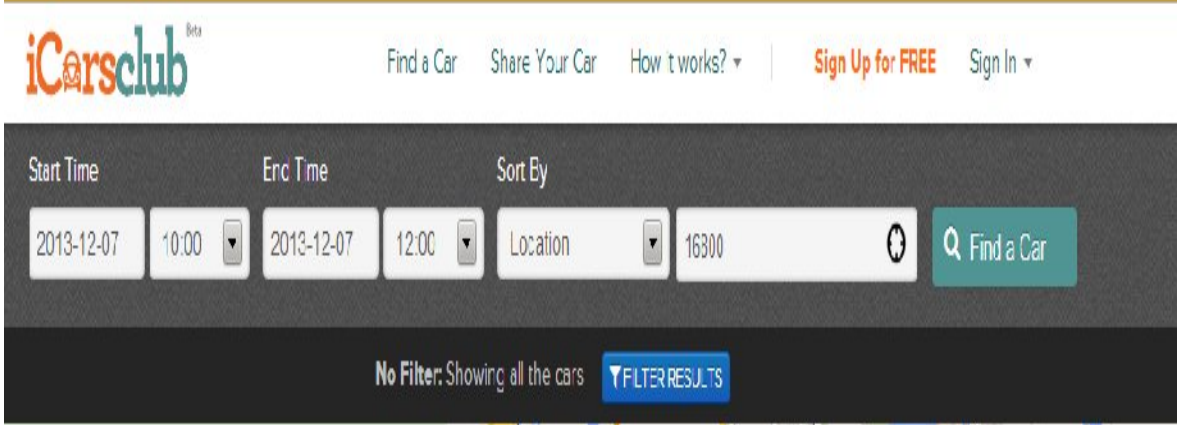
#### **Introduction**

In this part, will be explaining briefly about the existing Car Rental System that available in the market. In developing the Car Rental System for UMP case study, a various source of existing Car Rental System have been selected to be referred.

## 1.2 Review of Existing System

### 1.2.1 Reviews on Enterprise Car Rental System

#### 1.2.1.1 Introduction

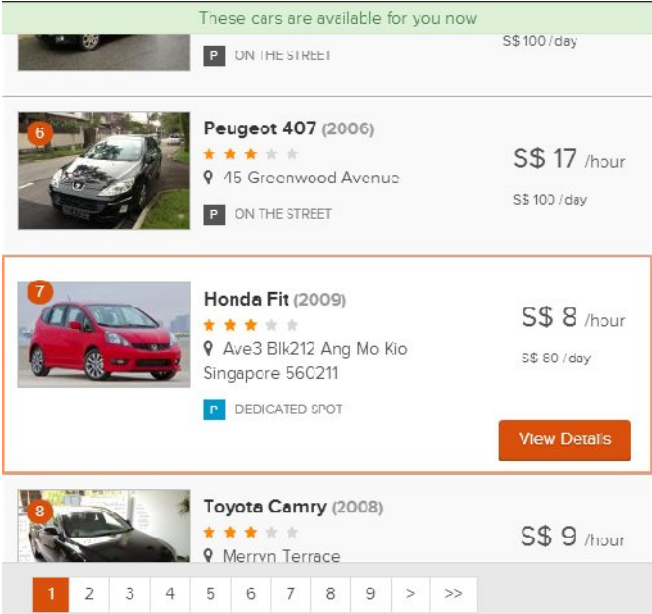
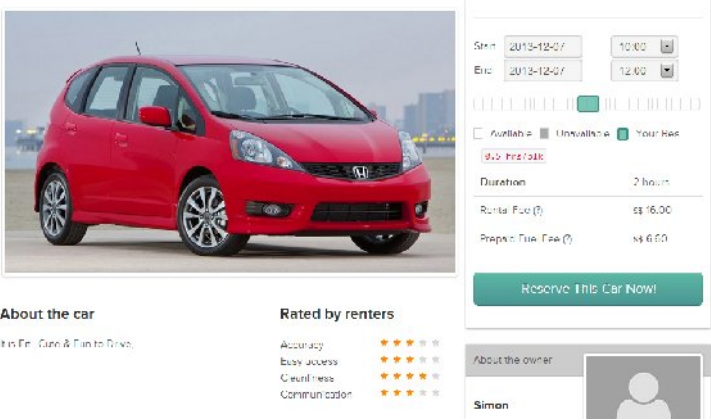
The image shows the top section of the iCarsClub website. At the top left is the logo 'iCarsclub' with a 'Beta' tag. To the right are navigation links: 'Find a Car', 'Share Your Car', and 'How it works?' with a dropdown arrow. Further right are 'Sign Up for FREE' and 'Sign In' with a dropdown arrow. Below this is a search bar with three columns: 'Start Time' (2013-12-07), 'End Time' (2013-12-07), and 'Sort By' (Location). There are also input fields for '10:00', '12:00', and '16300'. A 'Find a Car' button is on the right. Below the search bar, it says 'No Filter: Showing all the cars' and a 'FILTER RESULTS' button.

**Figure 1.2.1.1.1: ICarsClub car rental system check availability**

Above in Figure 1.2.1.1.1 is the Enterprise Car rental System home page. At a first, it looks nice as it uses dark color and not too many colors. What the most important thing need to add into the site is “Check availability” form at every of pages. This is because to easier customer in searching car without need to find where the form is located. There is no need put too much information on the check availability form likes input form users. This features will be add into the project in order to easier student find a car through a form. For this project, there are only a few input needs to gather form user form. All the another features will be discussed in sub topic 1.2.1.2.

#### 1.2.1.2 Features

In this sub topic will show the features available from the existing Car Rental System. All the features can be found in the table below:

Features	Screenshot	Description
<p>Available car</p>		<p>-List all the available car shown after click the search or check availability form.</p>
<p>Details cars</p>		<p>- Details car view after click the view details button.</p>

<p>User review</p>		<p>- Display user reviews at the details cars page for other rental interest</p>
<p>Details owner</p>		<p>- Show who's owner for the cars</p>
<p>Log in or create account</p>		<p>- Require login or create account to book</p>

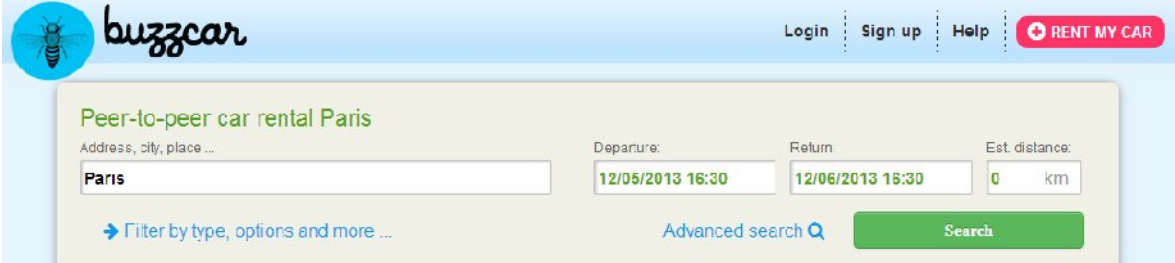
**Table 1.2.1.2.1: ICarsClub Features**

As shown in table 1.2.1.2.1, all states are the most features that need to add into the Car Rental System. For the available car features, system need to show correctly and consistent about the details of cars. At this part, the customer can see clearly the available car based on dates and times selected. If this features not state in car rental system, it would not be a consistent and hard for customer to know. Second features need to add is the user reviews about current status car that available. At this point, customer can see the condition of cars, how good the condition of cars based on the user rating. The car's owner also add into the system in order to see the details information the owner, but this system not shown details information about owner such as phone number or email for contact. Finally customer can reserve that car by clicking the reserve button, but the system need to gather the information about the rental, so they need to register an account if doesn't have an id or login directly if the rental is the return customers. Next we will see features from another existing car rental system.

## 1.2.2 Reviews on Buzzcar Car Rental System

### 1.2.2.1 Introduction

Buzzcar is a one of rich car rental system that available in the market. This system used rich web content for loading process. And this system also have good looking interface with not many colors attach to layout, the consistency of layout also can get interest of other rental to visit their site. But the major problem is, when using the rich web content, users need the high speed of internet in order to surf this content smoothly.



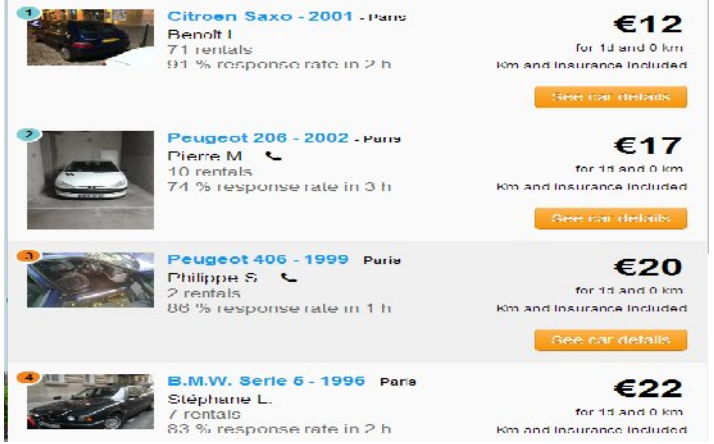
The image shows the Buzzcar website's car rental availability form. At the top left is the Buzzcar logo, a blue circle with a bee icon and the text 'buzzcar'. To the right are links for 'Login', 'Sign up', and 'Help', followed by a red button with a white plus sign and the text 'RENT MY CAR'. Below this is a search form with the title 'Peer-to-peer car rental Paris'. The form has four input fields: 'Address, city, place ...' with 'Paris' entered, 'Departure:' with '12/05/2013 16:30', 'Return' with '12/06/2013 16:30', and 'Est. distance:' with '0 km'. Below the address field is a link 'Filter by type, options and more ...'. Below the departure and return fields is a link 'Advanced search' with a magnifying glass icon. At the bottom right is a green 'Search' button.

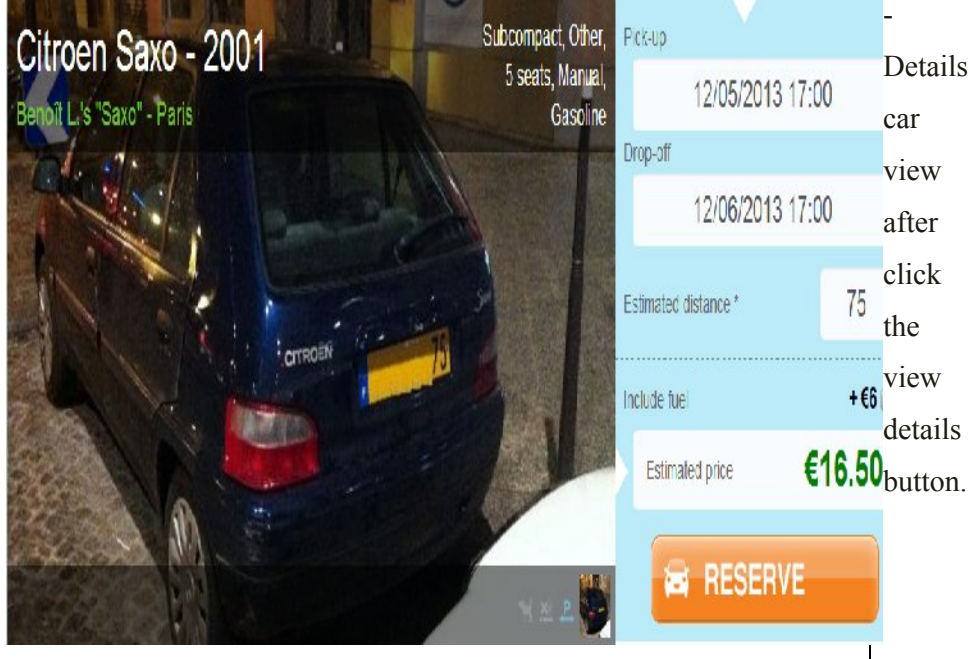
Figure 1.2.2. 1 : Buzzcar check availability form

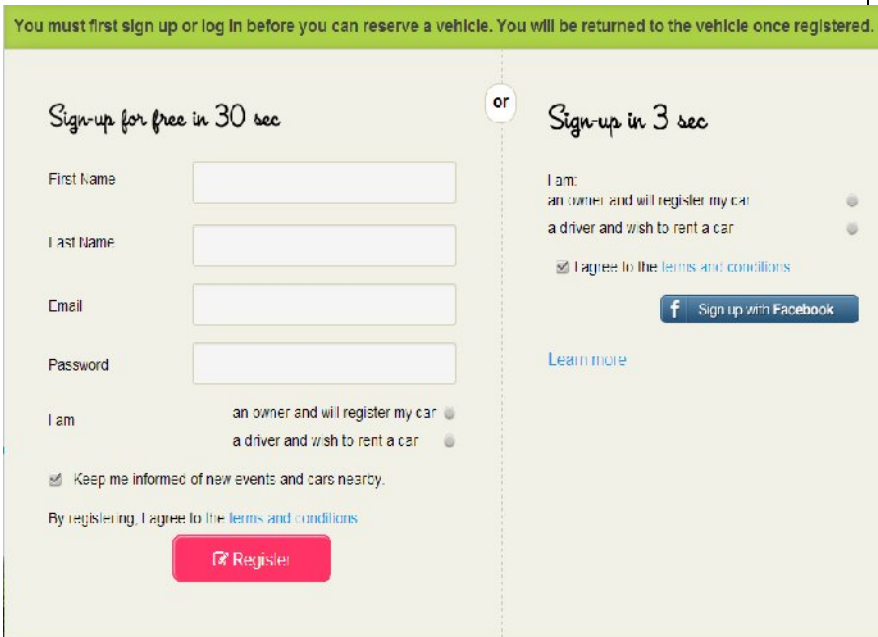


Above in Figure 1.2.2.1 is the Enterprise Car rental System home page. At a first, it looks nice as it uses dark color and not too many colors. What the most important thing need to add into the site is “Check availability” form at every of pages. This is because to easier customer in searching car without need to find where the form is located. There is no need put too much information on the check availability form likes input form users. This features will be add into the project in order to easier student find a car through a form. For this project, there are only a few input needs to gather form user form. All the another features will be discussed in sub topic 1.2.2.2.

### 1.2.2.2 Features

Features	Screenshot	Description
<p><b>Available cars</b></p>		<p>- List all the available car shown after click the search or check availability form.</p>

<p><b>Details car</b></p>	
<p><b>User reviews</b></p>	<p><b>Feedback</b></p> <p><b>Jawad M.</b> 10 days ago  Propriétaire très sympa et arrangeant.  Voiture fonctionnelle est pratique.  Première location réussie. Encore une fois, merci.</p> <p><b>Ayoub A.</b> 11 days ago  Personne très sympathique et arrangeante, je n'hésiterai pas à louer la voiture encore une fois ! Je recommande !  Merci Benoit !</p> <p><b>Serge M.</b> 18 days ago  Aucun problème, propriétaire très sympa.</p>

<p><b>Detail s car's owner</b></p>		<p>- Show who's owner for the cars</p>
<p>Log in or create account</p>		<p>- Require login or create account to book</p>

**Table 1.2.2.2.1: Buzzcar car rental system features**

As shown in table 1.2.2.2.1, all the features are look same with the previous reviews. For the car rental system, it should have the features state before. In order to develop features for this project, these existing systems can be a guideline for car rental system development.

### **1.3 Limitation and Suggestion to system**

#### **1.3.1 Limitation Car Rental System with E-COMMERCE**

Although the previous review concern more than a single system only, this sub topic will focus primarily on the limitation of Car Rental System with E-COMMERCE and ways to improve it. All the features states at the reviews part will be add into this project in order to ensure users satisfied with the project and can give advantages to both rental and car's owner.

The new project that will develop is not used rich web content like the reviews existing system. This because the internet connection in the UMP are not in full speed enough to surf a system that contains plugins and mores. Users need internet connection in order to check the availability of cars, without internet connection they can't surf this system. This project also only focuses on student UMP only and not to all the users outside UMP.

Furthermore, this system doesn't have the online banking payment for payment process. Usually, the E-COMMERCE needs the features like that in order to easier users doing payment. This limitation will be improved on next development with the full features.

#### **1.3.2 Suggestion to the Car Rental System with E-COMMERCE**

There are several suggestions that can be added into this project to ensure this project will become user friendly, consistent and functionality. Below are the lists of the suggested features:

1. Good looking user interface both rental and car's owner including administration site.
2. A suitable color matching for all users views.
3. Add the check availability on each page for the rentals.
4. User reviews and feedback from rentals.
5. Details owner information including phone number, email address and personal information's.

#### **1.4 Report Outline**

The overall of this report consist of three (3) main parts. Part 1 will discuss on the purpose of the project, existing system that related to the proposed system.

Part 2 will discuss on user requirement, design description, development plan and testing plan on the system.

Finally, it will discuss on the conclusion obtain in the overall process of the development of the system.

## **PART 2**

### **REPORT BODY**

This chapter includes the user requirements, methods and materials used technical results and comparison with previous works, discussion and analysis of materials and testing plan and results.

#### **2.1 User Requirement**

All user requirements located at Appendix A because the length of this document. The details of user requirement on how the system is running are detail out in SRS.

#### **2.2 Design Description**

All design description of the application is documented in the Software Design Documentation. Due to the length of SDD, it has been located at Appendix B.

## 2.2.1 Methods and Material

### i. Method

In development of system, the important thing must be pay attention is choose the right methodology that suite with the project that want to develop to ensure the phase of development running smoothly and ensure the project working properly and meet the customer's need. There are many type of methodology in web development one of them is agile methodology. For the development of this portal, the Agile methodology was chosen.

The Agile methodology is a one of the famous methodology based on iterative and incremental development, where requirements and solutions evolve through collaboration between self-organizing, cross-functional teams. It includes adaptive planning, evolutionary development and delivery, a time-boxed iterative approach, and encourages rapid and flexible response to change. An Agile methodology also is a alternative way other than waterfall. The figure 2.2.1 is a life cycle of agile methodology.



**Figure 2.2.1: Agile lifecycle**

**i) Requirements Planning**

In this phase, user requirements are collected and define what the first priority requirement. In order to meet the user's need, the requirement becomes the important part. At this stage, the user requirement about car rental system is collected. The planning process includes the plan schedule and plan what the task should be completed first in order. The task should be prioritized. For this system, the whole system is using the Model View Controller as a backbone which is suitable for this system. The MVC framework can make the car rental system more consistent with the code and library that already created by framework. For this system, Zend Framework is chosen for adaptation and integrates with the system itself. At planning stage, the security requirement also is defined in order to make the system more secure from being hacked by attacker. So, in order to avoid this from happening, Zend Framework makes the validation and introduced security into more tight. All of this are already included in Zend library. During the development phase, we just need to trigger this library and applied into the system.

**ii) Integrate and test**

After the requirement of user need is collected, the integrate and test phase is starting. At this phase, the development of project is start and at the same time the project also is tested to ensure the development of project working properly and the function of project are working without having much error. Looking at the figure 2.2.1, the integrate and test phase occur three time and the most important thing is after whenever the development of project was integrate, it come out with the testing together. For this system, the development phase is done one by one module which is needed to develop the requirement that having the high priority. At this moment, the registration phase by car owner and rental is compulsory. In order to make the vehicle available at this system when user make reservation, car owner need to register his/her car for rent. Before that, they need to register it, register as a car owner.

After the account were created, this system enabling user to register the car. Each registration came out with the payment. They need to pay for the registration of car.