

# **Vehicle Booking System for Human Resource Management UTP**

by

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Dissertation submitted in partial fulfilment of  
the requirements for the  
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**CERTIFICATION OF APPROVAL**

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A project dissertation submitted to the  
Computer and Information Science Programme  
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Approved by,

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UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

SEPT 2012

## **CERTIFICATION OF ORIGINALITY**

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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NUR ZARITH SUFIA BINTI ZULKEPLY

## **ABSTRACT**

In line with the advancement of current technology, every manual process being converted into computer-based process. The rapid changes of technology bring positive effects where people are easy to be contacted everywhere and at anytime. Thus, many of human activities may be accelerate in speed including booking process which usually takes several days to become two hour process. The purpose of this project is to develop a web based application system for Vehicle Booking Process (VBS) of Human Resource Management UTP (HRM UTP). VBS has been developed to automate the currently manual business processes. This portal is act as a one stop centre for staff and HRM Officer. By login to this website, it allows free registration and online application for requester. It is a web-based application system which allows data centralization. In order to achieve this objective, the author has done a lot of research in order to have a deep understanding about online booking system and how to design and develop a bets website. The methodology used for designing and developing this website is Iterative and Incremental Development Method with the integration of the test driven development model. The website interface designs are also included based on the comparison of existing website and user feedback. The author concludes with few recommendations in developing this website.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Background of Study

Automatic system is commonly misinterpreted nowadays. People judge the level of automatic when seeing the activity done with the equipped of computer or any related computer device. This level of understanding views the automatic system to be less structured and complicated. In contra, automatic define the flow of activity which being done with less effort. The problem aroused such as time-consuming procedure and high cost of execution where the similar process being done repeatedly being catered by automatic system with the integrated of computer or computer device.

Basically, in this project a web-based application will be created for Human Resource Management Department of Universiti Teknologi PETRONAS (HRM/UTP). The website will be occupied with the ability to manage and store data for every new booking systematically. The process involve including insert new data, retrieve data, save and delete data in one centralize database for HRM/UTP future use. In fact, further booking and maintenance would be able to be monitor appropriately. This website might also function as a medium to integrate staffs in Universiti Teknologi PETRONAS (UTP) who wish to use the vehicles for a specific purpose of trip as well as Human Resource Department to manage the booking system.

### 1.2 Problem Statements

UTP offer list of vehicles to be use by the staff in conducting events as well as for the usage of any related events that need to be attended by the staff as representative of UTP. This include bring the outsider to the UTP as to attend events conducted in UTP as well as representing UTP in conference. The current procedure of booking system is conducted manually where the staff needs to compose an email for application and attach the letter as prove in order for HRM/UTP to verify the event and confirm the booking of vehicle requested. Unfortunately, this method is very

time-consuming and the information is difficult to be retrieved back for any updates and corrections. Therefore, with the help of automated web based system with the capability of storing and analysing the information, the efficiency of the booking system will be enhanced.

### **1.3 Objectives**

This study will aim to achieve the objectives as below:

1. To enhance the current manual system in booking the vehicles offered to be use by the staff in UTP to web application system.
2. To develop one and centralize platform portal where staff can communicate with the management regarding the issue of vehicle booking process that centralized the database of vendor and cost center for future reference.
3. To integrate the web-based application with emailing system for notification.

### **1.4 Scope of Study**

In order to develop this application, several scope of study had been discussed to be achieved. The major scopes are as follows:

1. To get information and right procedure on vehicle booking procedure.
  - Several discussions have been conducted with HRM/UTP to get the most ideal way to integrate two parties which are the requester and the admin.
  - The procedure should be same as the existing procedure but it will be more effective after be implement in the automate system instead of email-basis booking.
  - The proper ways on handling and maintain the system should be considered.
2. Integrate the system with emailing system for notification and update.
  - The email will be sent automatically to the requester to notify about the status of the application.
  - The guarantee letter (GL) will be sent to the vendor's email and requester's email as a proof of approved application.

3. Design of the graphical user interface.
  - The good, attractive and convenient user interface should be considered in this system.
  - Eight (8) attributes of successful user interface will be considered during the design and development phase.
  - The design requires less effort to be used and understood by the user.
  
4. To study on the mechanism and tools used to develop this system.
  - Some research towards programming used in this system to ensure the best application used being conducted.
  - The Programming language that may be used such as Joomla!, XHTML, PHP and Database should not have any difficulties in order to prevent the project delayed.

### **1.5 Feasibility Study**

Web-based application is emerging out today. Besides its capability to be accessed by the user anytime, anywhere as long as the computer is able to access the internet; the storage capacity of the database is an important aspect to be concerned. Development of the application is tough as a lot of elements need to be put into considerations. The software that being used to develop the application must be able to be integrated with emailing system as one of the objectives that need to be achieved is email notification. The study of good graphical user interface (GUI) must be done in order to develop user-friendly GUI. Experience and knowledge with the technology and tools are essential as this will help during the development of the proposed system. Time allocated for developing the system is about a year which is very flexible yet tough as the project management plan should be followed accordingly.

## **1.6 Limitation**

In developing the project, some limitation should be concern to ensure the development phase is controlled and monitored accordingly. Some limitation had been discovered and listed below:

- The functions offered to the approver must be disable for requester.
- The procedure of the request must be maintain even the system being improved.
- Not all lecturer and staff has the intention to register unless they face the situation where they need to request
- Not all web based developer tools support all the function offered for this project.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Web-based Application**

People define manual process as a system which does not use any computer devices. All data would be kept in other ways, mainly paper. Previously, human being use typewriter and paper to keep data. People argue the disadvantages of implementing manual system such as high cost as well as lack of security and maintainability.

Nowadays people change to use a systematic way of executing an activity. One of the proposed systems commonly used is web based system. According to Victor Stanwick, web based system defines the application that can only be used with the equipped of active Internet connection and that uses HTTP as its main communication protocol [1].

On the other hand, web based system is defined as an application that being accessed over a network such as internet and intranet [2]. The application may be a computer software application that is developed and embedded in a browser-supported language and rely on web browser to render the application executable [3].

Broadly, one could argue that development of web application is complex. A survey had been carried out by McDonals and Welland (2001), the developer of web application claim that most of their Web development projects are running over time and budget due to problems in capturing and gathering the requirement as well as poor communication between themselves and their client [4].

Despite the complexity of the web development, one believes that communication between developers and client is fundamental in gathering the requirement. Human factor that vital in requirement engineering not only concerned with disciplines in

handling technical aspects but also in discipline in handle cognitive, cultural and social aspects (Goguen and Jirotko 1994) [5].

## 2.2 Computerized System

With the new advancement of technology, it is possible to start up and equilibrate system automatically to a selectable analytical method [10]. In this project, the author anticipates to develop an automated system which reduces the complexity of the current existed manual system. The system proposed will enable the admin to remotely control the system by manipulating the view of the stakeholder involved in the system [11]. In addition, the system proposed will be able to integrate the parties involved. This includes the requester, the approver as well as the admin. The requester need not to manually apply via emailing system. These series of steps required manual start up which tedious, time-consuming and prone to error [11]. They only need to fill the form which provided. By making the system operated and conducted using computerized system, it will also increase the competition in term of market value [12].

## 2.3 Existing Vehicle Booking System

1. Vehicle Booking System of Universiti Sains Malaysia

Refer <http://registry.usm.my/stkv2/>



Figure 2.1 : Homepage of Vehicle Booking System of Universiti Sains Malaysia

## 2. Vehicle Booking System of Universiti Putra Malaysia

Refer <http://eng.upm.edu.my/stat/>



Figure 2.2 : Vehicle Booking System of Universiti Putra Malaysia

## 3. Vehicle Booking System of Politeknik Melaka

Refer <http://result2.polimelaka.edu.my/ekenderaanpmk/index.asp>



Figure 2.3 : Vehicle Booking System of Politeknik Melaka



#### 4. Vehicle Booking System of Universiti Kebangsaan Malaysia

Refer

<http://ewarga.ukm.my/spkend/login.cfm?CFID=510045&CFTOKEN=36920>

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Figure 2.4 : Vehicle Booking System of Universiti Kebangsaan Malaysia

### 2.3.1 Design and content

#### 2.3.1.1 List of Menu

Referring to the websites, only two website show the list of menu at the public homepage which are VBS of Universiti Sains Malaysia and VBS of Universiti Putra Malaysia. The advantages of keep the menu public is that everyone who have not yet sign in to the website know what he can do by using the website.



Figure 2.5 : The Menu List of VBS Universiti Sains Malaysia

The menu is arranged in horizontal order and located at the top of the website. As people view the website, the eyes of the user catch the menu offered first because the position of menu offered located at the most visible area which is navigation area.



Figure 2.6 : The Menu List of VBS Universiti Putra Malaysia

Differ from VBS of Universiti Sains Malaysia, VBS of Universiti Putra Malaysia arranged the menu in vertical order. The location which is in left hand side is more visible as compared to the right hand side.

### 2.3.1.2 Overall Website

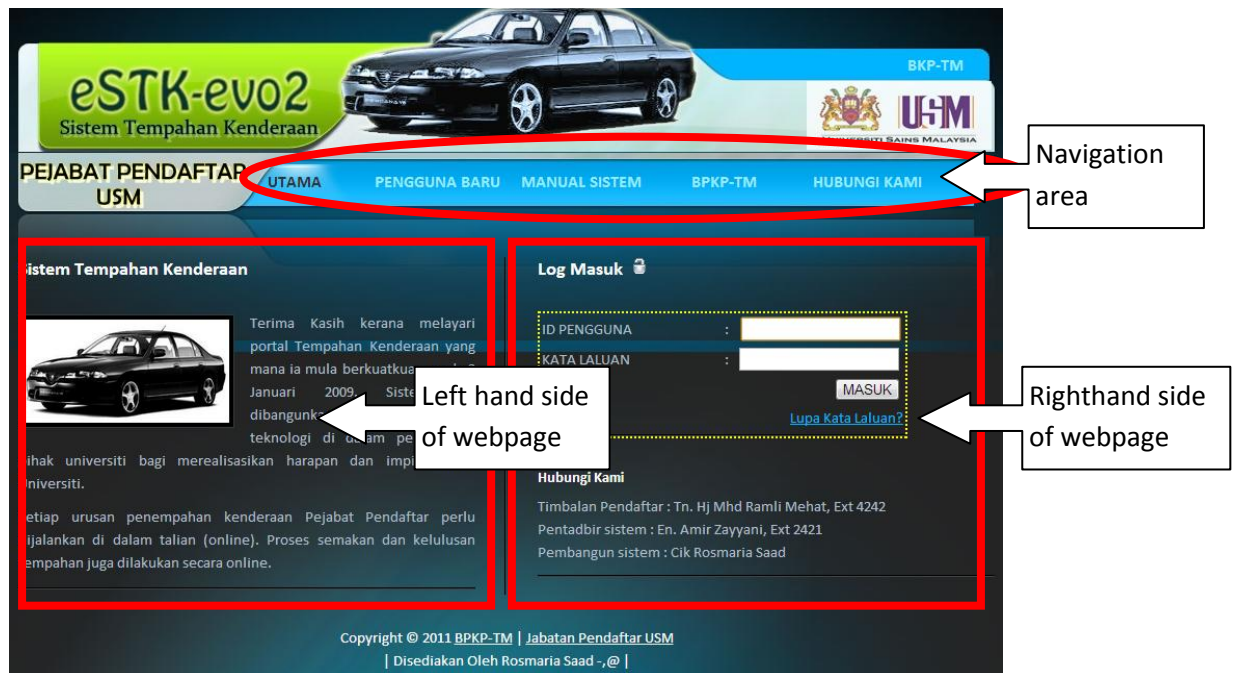


Figure 2.7 : Layout of Vehicle Booking System of Universiti Sains Malaysia

Universiti Sains Malaysia (USM) has implemented the online vehicle booking system from the past three years. The system is being available on 2<sup>nd</sup> January 2009. The main page of the website is divided in to two columns. The right hand-side of the page displays the brief introduction about online vehicle booking system whereas the left hand-side of the page displays the log in column. The navigation of the web page is sort horizontally. It includes the registration of the new user, manual for the first time user, a link to the super admin and contact us information.

The website is designed to meet the requirement where everybody regardless they are the user of the system or not to understand the flow of the booking system. From the author point of view, as long as the information displayed is not confidential, it may be share to the public.

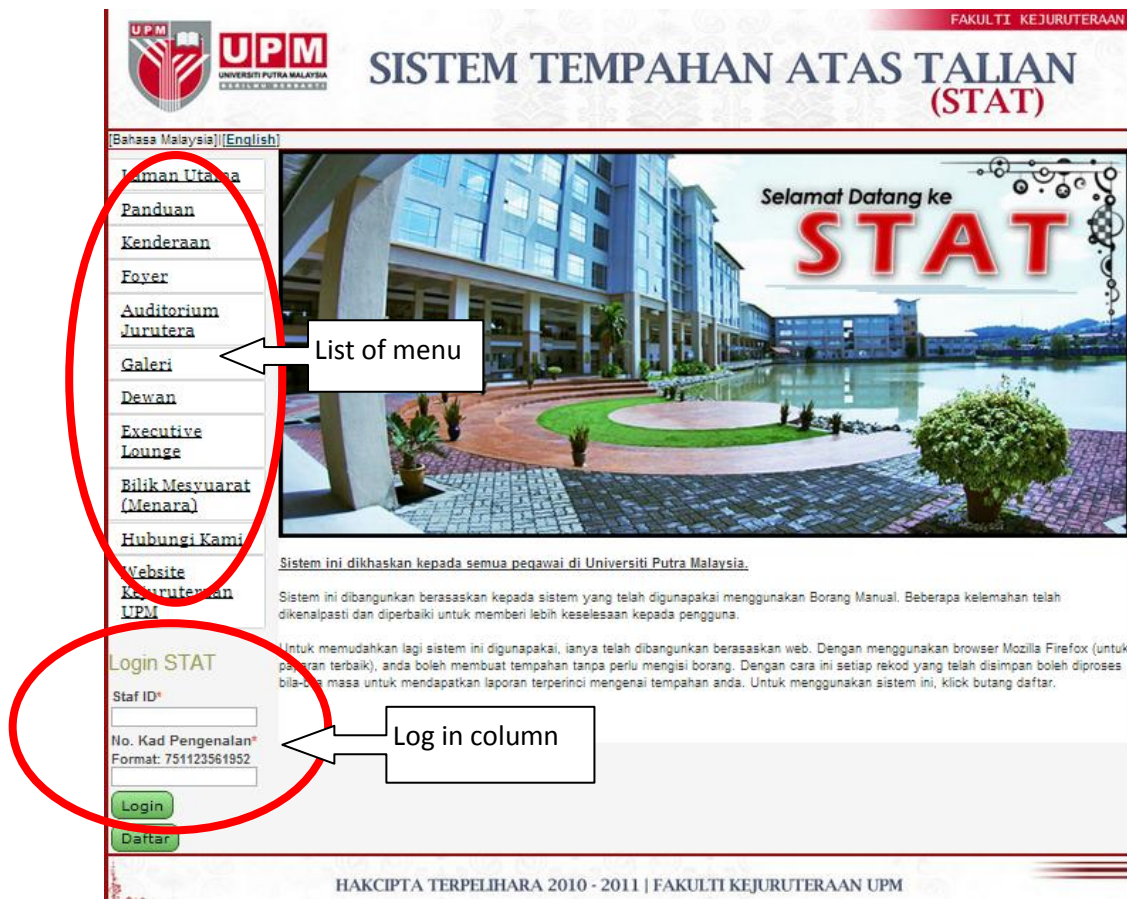


Figure 2.8 : Layout of Vehicle Booking System of Universiti Putra Malaysia

Figure shows the online vehicle booking system of Universiti Putra Malaysia (UPM). The layout of the webpage is common to the user as such it will increase the learnability of the novice user. The webpage is divided into four parts which are the header at the top of the webpage that display the name of the system, the navigation side on the left-hand side which include the webpage available, the content page that explain the overview of the system at the mainpage and the footer side which contain the right to the intellectual property.

The log in column is placed on the navigation side below the list of shortcut available. From the author point of view, the location is not look able where has been placed near to the bottom of the web page. The good graphical user interface should sort the content according to the priority of the functionality. Log in button is considered as the most important functionality as the online vehicle booking system itself was being developed to reduce the manual system of the user into computerized system or online booking system.



Figure 2.9 : Layout of Vehicle Booking System of Politeknik Melaka

Figure shows the online vehicle booking system of Politeknik Melaka. The webpage is divided into three parts which are header, navigation and content part. From the author's point of view the order of webpage is simple and user friendly. It has being arranged vertically and only necessary information was being displayed in the main page. The navigation is different from other webpage where it place and the second top of the webpage. The language used at the welcoming note is simple and understandable. The good hierarchy of webpage order was being showed here clearly where the first time user will initially read the welcoming note that explain how to log in to the system. Only after that they will move their eye to the below part which is log in column and administrator login button to log in as administrator.

However, the system does not support direct help if the user fails to log in to the system or encounter problem during the log in process. There is no contact information that being placed in the webpage that may help under urgency.



Figure 2.10 : Layout of Vehicle Booking System of Universiti Kebangsaan Malaysia

The figure shows the online vehicle booking system of Universiti Kebangsaan Malaysia. From the author's point of view, the colour chosen play the important role in developing website as it affects the mood of the viewer. It should be chosen in such a way which suits the subject of the website. As we can see in the online vehicle booking system of UKM, the blue colour is soft and the web designer choose to make the combination of three colours which are white, grey and blue.

Other than that, the layout of the website is common. The header shows the attractive cars and clear font was being used to display the name of the website application. The content area has being divided into two parts which are log in part and contact us part. As we can see, the webpage never explain what is the main functionality of the website but the role to explain was being played by the clear font and attractive vehicle. Other than that, only registered user that successfully log in to

the system have the authority to view the manual on how to use the system and other info beside the ‘contact us’ info.

According to Hammerich and Harrison (2002), clarity, credibility, conciseness and coherence of content in websites contribute to web ability to persuade a reader that has the right matter. Clarity can be defined as ability to write and edit texts that are clear and easily readable by users. Example like keep paragraphs short and discuss only one topic per paragraph. Credibility is the quality, capability or power to elicit belief is depend on the eye of the beholder. Next is conciseness, concise means able to present topic in the most economical manner possible, be brief but tough. Last is contents of website must be coherence, by minimizing users cognitive work, all parts of text must be connect together in clear and logical ways.

## **2.4 Planning and Design Consideration**

In designing the application that will be used by the users which have various background and most of them are very familiar with the computerized system, the biggest challenge that need to be stressed are the design of the graphical user interface. The interface design need to be an effortless, ordinary, and engaging interaction between a user and a system, and it allows users to carry out their specific tasks [13]. Most approaches to software quality do not deal explicitly with user-perceived quality. For instance, according to Garvin (1984) [6], “Perception of quality can be as subjective as assessment of aesthetics”.

However, there is a more fundamental reason for being concerned with user perceived quality. Products manufactured being recognized as quality product when it has a good quality in relation to their intended purpose [14]. The term quality itself define the extent to which a product satisfies stated and implies needs when used under stated condition [14]. Based on the review research of conventional product which serve specific user such as HRM officers and UTP lecturers, the author come out with the combinations of several principal of web-based application design.

1. Context use for evaluation
  - When specifying or evaluating the usability, it is important that the context selected is representative of the important aspects of the actual and intended context of use. Particular attention should be given to those

attributes which are judged to have significant impact on the quality of use of the overall system.

## 2. Effectiveness

- Measures of effectiveness relate the goals of using the system to the accuracy and completeness with which these goals can be achieved.
- Task effectiveness can be calculated using below formula:
  - o Task effectiveness =  $1/100 (\text{Quantity} \times \text{Quality}) \%$

## 3. Productive Period

- The unproductive periods of the task are periods during which users are seeking help, overcoming problems and searching hidden structures of product.
- The productive period of a user is the productive time expressed as a percentage of the Task Time
  - o Productive period =  $(\text{Task time} - \text{unproductive time} / \text{Task time}) \times 100 \%$

## 4. Measures of learning

- The rate, at which the user learns how to use particular products in specified contexts, can be measured by the rate of increase exhibited by individual metrics when the user repeats the evaluation sessions.
- The relative user efficiency can be calculated using below formula:
  - o Relative user efficiency =  $(\text{User Efficiency} \times 100\%) / \text{Expert efficiency}$

## 5. Measuring satisfaction

- Satisfaction is composed of acceptability of use and level of comfort. Comfort refers to overall p
- hysiological or emotional responses to use of the system while acceptability of use may measure overall attitude towards the system, or the user's perception of specific aspects.

## **2.5 Existing Application**

The author chose to study the current existed automated system applied nowadays which is Automated System for Examination Timetabling. Analysis and some research have been made to identify the features and weaknesses of current system



applied in timetabling system [15]. Even though the stakeholder of the project is totally different with the author's project, but the author had captured several features of current system and the disadvantages of them. The disadvantages of the features will be issue that the author tries to defeat and compose them as the advantages in the proposed system.

**Table 2.1 : Critical Analysis**

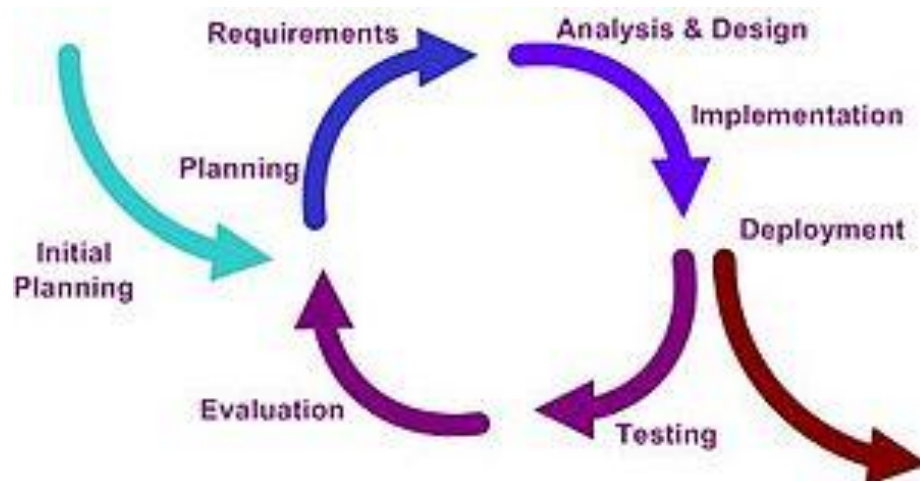
Booking System	Features	Disadvantages
<b>Resource requirement</b>	The resource which offer being displayed to the requester.	The decision making by the approver being influenced by the favouritism of the requester. This leads to the bias decision making especially when the resource is unavailable.
<b>System notification</b>	No notification provided.	The requester does not know the current update and admin nee to log in to the system to check for new booking application.

## CHAPTER 3

### METHODOLOGY

#### 3.1 Iterative and Incremental Development Method

There are many methods that being suggested to develop booking system. In developing UTP Vehicle Booking System, the author decides to use iterative and incremental development method. In this method of development, the model is designed, implemented and tested incrementally. It involves development and maintenance. It starts with an initial planning and ends with deployment with the cyclic interactions in between [8].



**Figure 3.1 : Iterative and Incremental Development Cycle**

Iterative and incremental model is an evolution of waterfall model, where the waterfall model is applied incrementally [8]. One of the advantages of implementing this method is the faulty can be inspected easily as very few changes are done after every iteration. So, it is easier for me to test and debug as testing and debugging can be performed after each iteration.

To go in deep, the incremental development means the project itself is divided into various independent parts and the developer develop the sub parts at the same or different rate and the system is integrated when ready.

Besides, the iterative itself means the project is built in iteration, where each iteration expands the product until the project completed.

Planning is start during the third week of study where we notice some of the flaws occur when UTP staff would like to request for vehicles. They need to compose the application email and attach the support letter as evidence. With the idea of implementing UTP Vehicle Booking System, the staffs which need to request to use the UTP vehicles only need to fill the online application form for booking process.

Requirement gathering is an essential part of software development. The requirement is collected from custodian, Mr Aminur Rashid and Ms Rodziah, Human Resource Department Universiti Teknologi PETRONAS regarding the problem they face when they need to manage the request for vehicles. By interviewing and surveying, the common flaws that being faced by most of the staff is collected. Other than that, research on the basic element that needs to be implemented in online booking system is done throughout the requirement gathering phase.

Requirement analysis and design in software engineering encompasses the tasks that go into determining the needs or conditions to meet for a new product. I have to take into account of the possible conflict that may arise during and after the development of the system such as the changing of UTP policy as well as changes of procedure on booking system.

The implementation and deployment phase starts at Week 1 of next two semesters where the author enrol to Final Year Project 2 course. The author first develop the general GUI which the GUI being available for any viewers of the application. After that, the page for admin which is HRM staff being developed and the functionality such as check for applicant, add vendor and add cost center being integrated with the general functionality being that developed before. As final, the GUI of requester which is UTP staff such as staff manual page, online application page and frequently asked question page were developed. The integration of the all the webpage is done after every functionality being tested and successfully working. The test being conducted and the end user is the people who frequently use the UTP vehicles such as HRM officers and UTP lecturers.

During testing phase, the author integrates the test driven development (TDD) with iterative and incremental model. TDD is a software development process that relies on the reiteration of a short development cycle. After developing the failing automated test case that defines a desired improvement, the codes that pass the test is constructed [9].

There are several steps had been done accordingly in applying TDD:

- 1. Developer writes a test that specifies a bit of functionality. Test is written so that it fails.*
- 2. Developer writes code as little as possible to make test pass.*
- 3. Developer does some refactoring to the code to ensure that it has simplest possible design and finishes writing the functionality.*

Evaluation phase has been done after the testing being conducted and the amendment is catered. The error occurred during the testing being solved according to the level of complexity of the error. The amendment is evaluate to ensure that the design implemented meet the requirements.

### **3.2 Development Tools**

The system will be developed using handful platforms to facilitate and enhance the development process, also improving the system output.

#### **3.2.1 Hardware**

The hardware that will be used throughout the development phase is Acer Aspire 4315 with the specification as described below:

<b>Operating System</b>	<b>Window 7 Home Premium</b>
<b>Processor</b>	Intel (R) Celeron Processor 560
<b>Memory</b>	2.00 GB
<b>Disk Space</b>	500 GB

**Table 3.1** Personal Computer Specifications

### 3.2.2 Software

#### Prototype Development Environment

Items	Prototyping Tools
Programming Language and GUI Design	Macromedia Dreamweaver, PHP
Database	phpMyAdmin – MySQL database
Operating System	Microsoft Window 7
Computer Browser	Mozilla Firefox, Google Chrome

**Table 3.2 Software Tools required in Development Phase**

### 3.3 Development and Implementation

Application will be developed based on the type of user functionality. In the first stage, the general functionality such as homepage, user manual page, registration page, frequently asked question page and contact us page were developed. In parallel with that, the database was designed and login table was built. After that, the functionality such as log in and register were embedded. The connection of homepage with database was managed in order to direct the functionality with stipulated table.

In the second stage, the functionality of staff such as homepage, user manual page, online application page, frequently asked page and logout button were developed. To embed booking application function, request table was built.

As the staff function was successfully developed, the functionality of admin such as homepage, check for applicant page, add cost center page, add vendor page and logout button were built. To embed the process of adding cost center and vendor, the database was being enhanced and table of vendor and cost center were built.

After finishing with the development phase, this application being tested and be delivered as a final product. Below are the figures on the development of the Vehicle Booking System for both semesters.



Figure 3.2 shows the system architecture of Vehicle Booking System. There are two parties involve which are staff and HRM Officer. Firstly, the staff will fill in the online application form in the website and submit it to the admin which is HRM Officer. Secondly, HRM Officer will check for the applicant and verify either to approve or reject the request. As he processed the application, a notification through email will be sent to the staff that requests the vehicle booking.

## CHAPTER 4

### RESULTS AND DISCUSSIONS

#### 4.1 Data Gathering & Analysis

The author had used interview technique for “Vehicle Booking System” project. Several interviews had been conducted during the analysis phase in order to gather all the information about vehicle booking system. Three different types of users have been selected as the interviewees. They are a staff of Human Resources department, IT maintenance and a postgraduate student.

<b>Date</b>	<b>Activities</b>	<b>Purpose of Interview</b>
<b>23 February 2012 10.00-11.00am</b>	Interview with Staff from Human Resource Department	The current process of Vehicle Booking Process at UTP
<b>15 August 2012 2.00-3.00pm</b>	Interview with Staff from Human Resource Department	Propose the design of GUI
<b>8 November 2012 3.00-4.00pm</b>	Meeting with Staff from Human Resource Department	User testing

**Table 4.1 : Interview and Meeting Schedule**

Firstly, interview had been done with Mr. Aminurrasyid from Human Resource Department. The purpose of this interview is to fully understand the current flow of booking process and gather the requirements for the system. The author gets a lot of information regarding the current vehicle booking system process and suggestion and opinions from interviewees in order to enhance the system. The issues being arose by the interviewees are the current manual system require time consuming process of updating the booking applications. The manual system which uses Microsoft Excel and Word provide limited features just for entering, searching and printing data. The process itself consumes a lot of repetitive work and it cause loss of documentation file



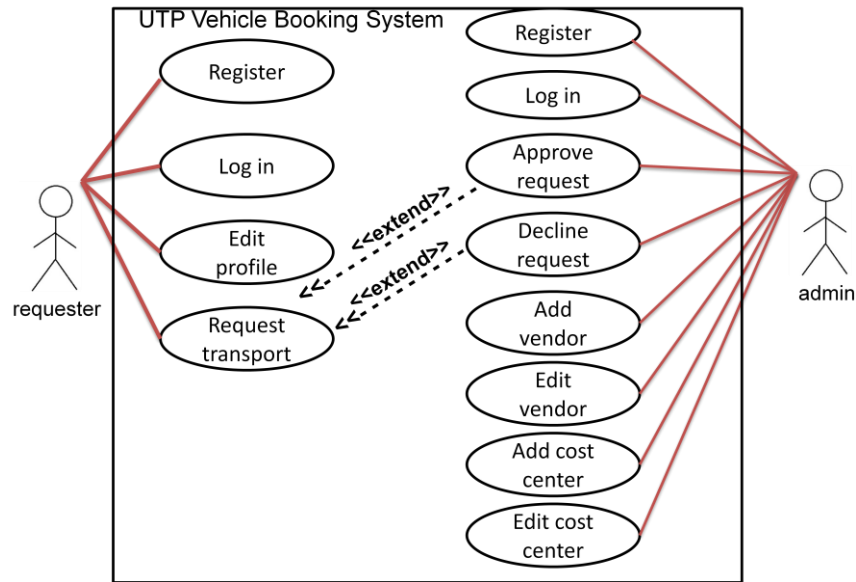
for future reference due to too many papers and manual process involved. Apart from that, they also give their concern and feedback for this project.

Secondly, meeting had been conducted with Mr. Aminurrasyid from Human Resource Department. The objective of this meeting is to propose the design of the GUI to be review first before proceed to development phase. The author explained every each steps of the process to confirm that the process of vehicle booking is maintained even though the medium of communication was being enhanced to web based application. The interviewee also request for added function that can extract the booking record to be downloaded to Excel form for future reference.

## **4.2 Functional Modelling**

### **4.2.1 Use Case Diagram**

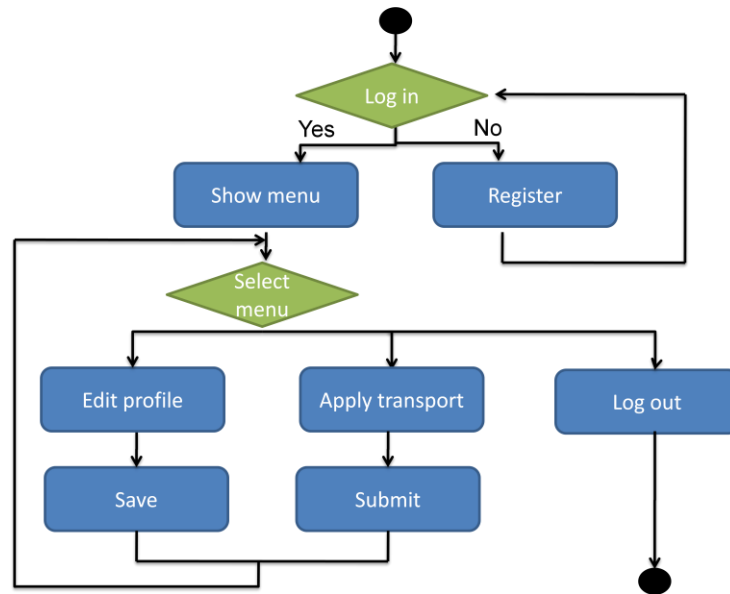
This use case diagram shows the functionalities of the author project. Three different actors are engaged in this system where the requester able to register, log in, edit profile and request transport. On approver side, the register cases happen limitedly since the limited number of approver is applied in the system. The functionalities that apply to approver are register, log in, approve request, decline request, add vendor, edit vendor, add cost center and edit cost center. The power to make decision whether to approve or decline the request is handled by the approver. The approver need to check the existence of the event as well as confirm any changes occurred before request the service from vendor. As a major actor in the system, admin play important role to maintain the security of the system which include preserve the confidential documentation, monitor the system as overall and manage view of users. Manage view of user include the displaying of different interface according to the group of entity that sign in to the system.



**Figure 4.1 : Use Case Diagram of UTP Vehicle Booking System**

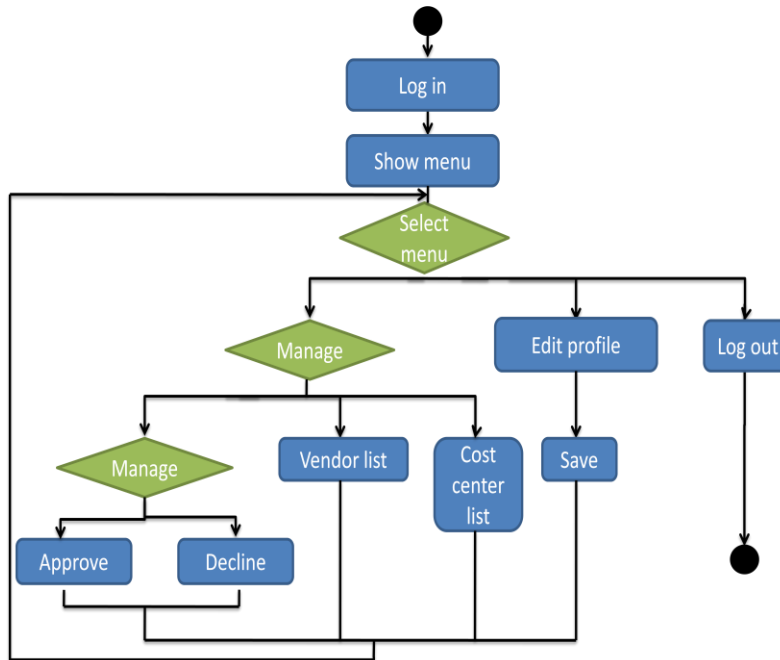
#### 4.2.2 Activity Diagram

The activity diagram below illustrates the basic flow on the requester side. The requester is unable to log in if he has no account. Hence, if login fail, the next process needed to be execute is register to the system. As the requester successfully log in, the menu appear to be chose. The requester may select anyone menu such as edit the profile, apply transport or log out. For edit profile menu, the requester able to update their basic information such as change name, position, department, telephone number, email address, the username as well as password. For apply transport menu, the requester able to enter the purpose of trip, person to fetch, the contact number of the person to fetch, the address to fetch and send, number of ways, type of vehicle as well as cost centre. As the form is completely filled by the requester, they may submit the form and a command prompt that tells the requester that they request has been successfully submit to approver will be prompt.



**Figure 4.2 : Activity Diagram for Log in as Requester**

The activity diagram below illustrates the flow on the approver side. As the approver successfully log in, they can choose to edit the profile, manage the request, vendor or cost center; or log out. Under manage request, the approver have the authority to approve or decline the request. Basically, they will first ensure the existence of the event and confirm the date and place to pick up as well as the name and the contact number of the person to fetch. Under manage vendor, the approver may update the company name, company registration number, address, fax, email address, website, contact person as well as the email and the position of the contact person. On the other hand, under manage cost center, the approver may also update the information such provided in the form of vendor.



**Figure 4.3 : Activity Diagram for Log in as Admin**

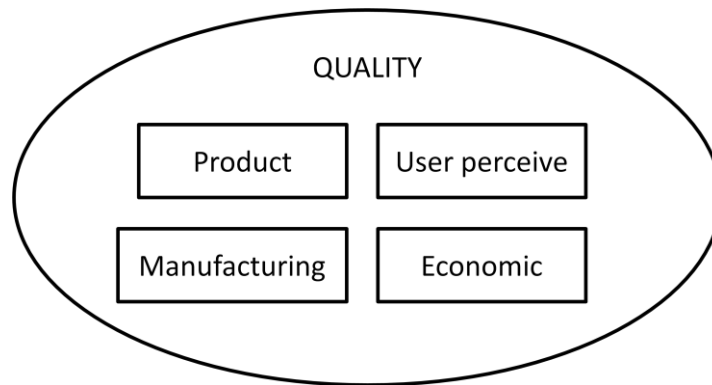
The activity diagram below illustrates the flow on the admin side. As the admin successfully log in, they can choose to manage the requester and approver or to add another admin. Under manage the requester, the admin have the authority to add or remove the requester. This can be done when one of the lecturer leave the university or further their study. Similar to manage approver menu, the admin able to add or remove the approver according to the current number of employee in HRM department.

### 4.3 System Interface

After evaluating several criteria of a good graphical user interface, the author has come to several ideas in designing the system as to meet the user requirements. In designing the system especially the interface, usability and learnability is an important attribute that need to be put in high priority.

The quality element plays a very important role in achieving the successful of the user interface design. There are many different interpretation of the term ‘quality’ as it seems to be self-explanatory in everyday usage, and in practice, there are many different views of what it means and how it should be achieved as part of software production process.

According to Garvin (1984) [6], there are four practical approaches to quality:



**Figure 4.4 : Four Practical Approaches to Quality**

*Product quality:* an inbuilt feature of the product determined by the presence or absence of measurable product attributes.

*Manufacturing quality:* a product which conforms to stipulated requirements.

*User perceived quality:* the combination of product attributes which provide the supreme satisfaction to a specified user.

*Economic quality:* a product which provides performance at an tolerable price, or conformance to requirements at an acceptable cost.

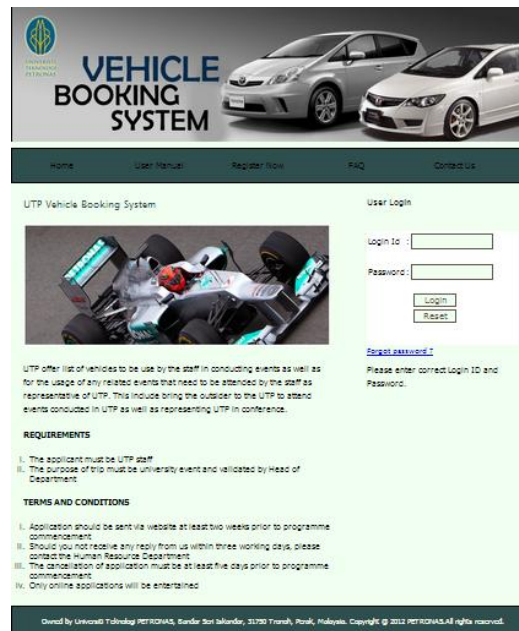
Under user perceived quality which pressed on the permutation of product attributes that lead to user satisfaction, the author has come with the research of the good user interface design

According to Spillers. F [7], user interaction itself reflects to the interaction of cognition and information processing as embodied by task routines or sequences that are commonly captured in a task analysis. Hence, the idea of make the user interface to be similar to *facebook* with the aim to ensure the interface design is understandable and recognizable come out with by manipulating the cognitive mode of the user.

#### **4.3.1 Graphical User Interface of Requester (Log in as Staff)**

### 4.3.1.1 Main Page

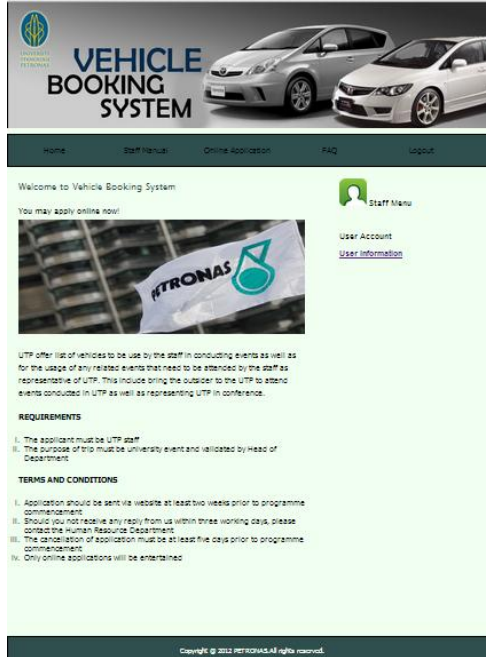
The main page of the system appear to be same for requester and approver. The navigation of the main page is the title of the system. The logo and the vision of mission of HRM/UTP may be place here. The work area is divided into two sections. The left hand side is leave as an introduction to the Vehicle Booking System where it conveys information about the requirement and term and conditions for booking process. The right hand side is the most important section. It locates the log in and forgot password column.



**Figure 4.5 : Main page for UTP Vehicle Booking System**

### 4.3.1.2 Home Page

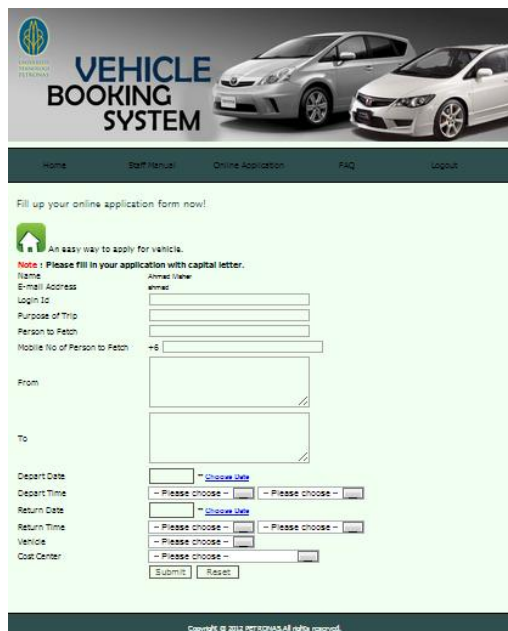
The homepage is the page that appear after the requester successfully log in to the system. At the navigation area, there are several menus available for requester such as Staff Manual, Online Application, FAQ and Logout.



**Figure 4.6 : Home Page of Requester**

### 4.3.1.3 Online Application Page

In the Online Application page, the requester needs to fill the form completely. Leaving at least one of the spaces blank will disable the user to submit the form.



**Figure 4.7 : Online Application page**

#### 4.3.1.4 Staff Manual Page

In the Staff Manual Page, the procedure of booking process is explained precisely. Simple and understandable language has been used in order to ensure the requester understands the flow that he needs to do to apply for the vehicle.

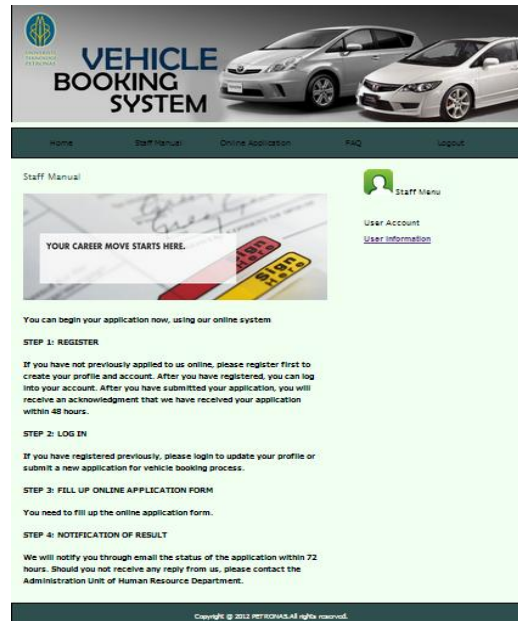


Figure 4.8 : Staff Manual page

#### 4.3.1.5 Frequently Asked Question Page

In the Frequently Asked Question Page, the basic question asked by user and the answer of every each question being displayed.



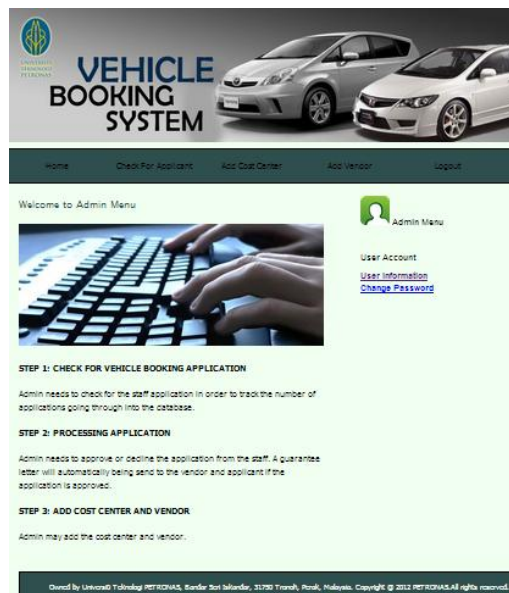


**Figure 4.9 : Frequently Asked Question page**

### 4.3.2 Graphical User Interface of Approver (Log in as Admin)

#### 4.3.2.1 Home Page

The homepage is the page that appear after the approver successfully log in to the system. At the navigation area, there are several menus available for requester such as Check for Applicant, Add Cost Center, Add Vendor and Logout.



**Figure 4.10 : Home page of Approver**

### 4.3.2.2 Check for Applicant Page

When approver moves the cursor to Check for Applicant column, the page will appear list of request according to the first application to the last application. Approver may click on each request to approve or decline the request.

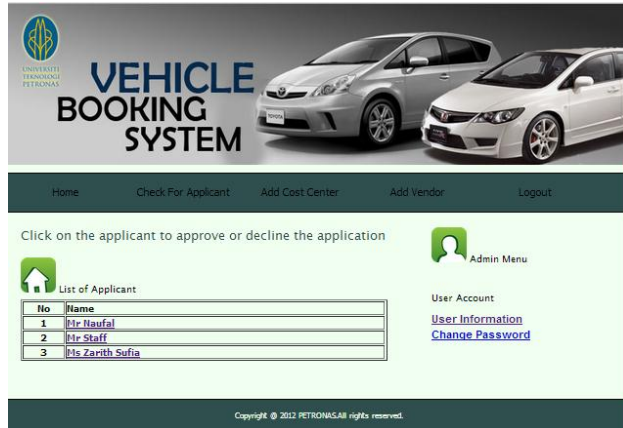


Figure 4.11 : Check for Applicant page

After approver chooses any one of the request, the summary of the request will be display. The approver may choose to decline or approve the request.

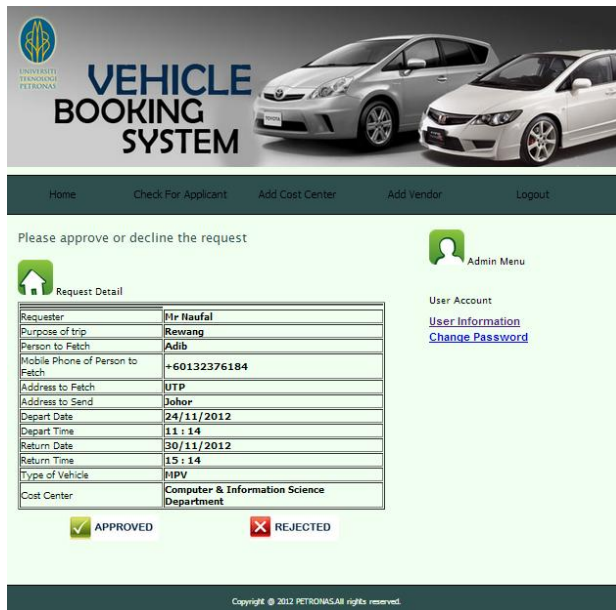
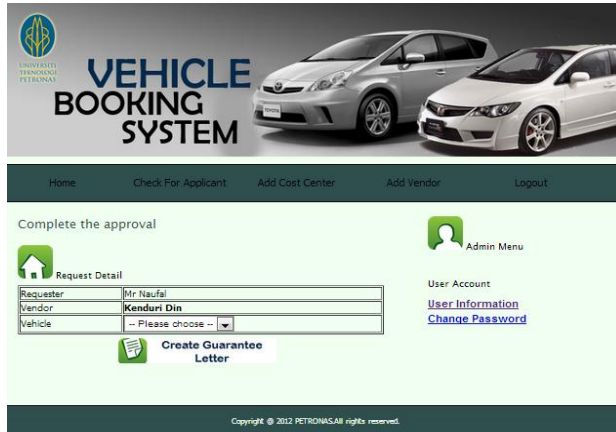


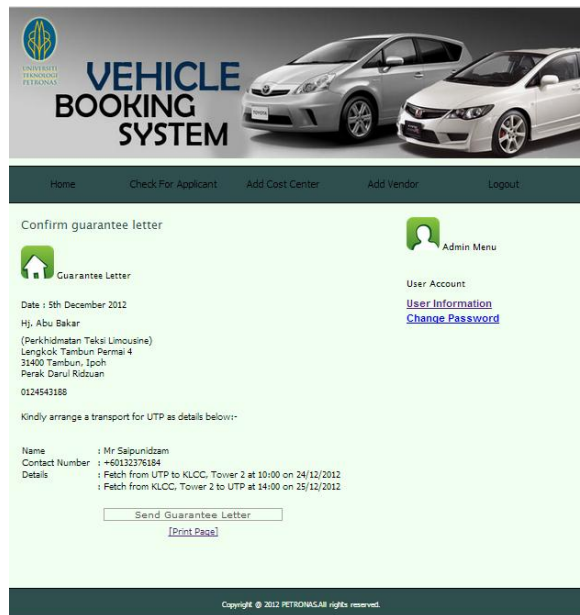
Figure 4.12 : Summary of the Request

If the approver chooses to approve the request, they need to specify the vendor and type of vehicle that will be offer to the requester and click Create Guarantee Letter button.



**Figure 4.13: Further Action for Approve Decision**

After approver click Create Guarantee Letter, the page display the Guarantee Letter for approver to double check the type of vehicle and the vendor chose. In this page, approver may click Save Button to save the letter or click Print Button to print the letter. After checking the specification, approver may click Send Guarantee Letter to send the letter to vendor as well as requester.

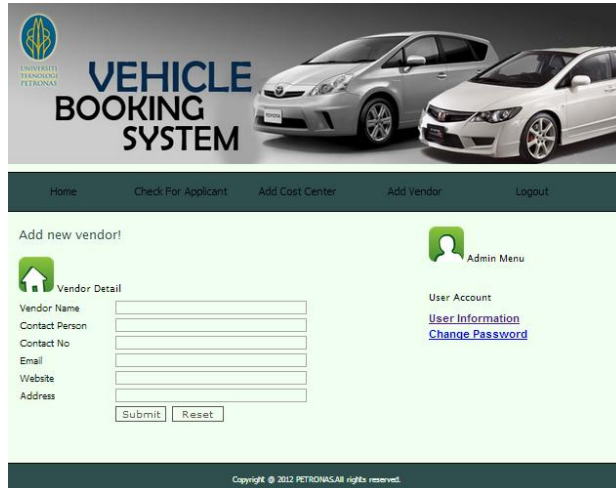


**Figure 4.14: Send Guarantee Letter for Approve Decision**

When approver click Send Guarantee Letter Button, the pop up window that informing that the Guarantee Letter has been successfully send to the vendor and requester will prompt out.

### 4.3.2.3 Add Vendor Page

As approver click Add Vendor page, the page will appear a blank form to be filled by the admin in order UTP add more vendor to the list. Approver may click the Save Button to save the record.

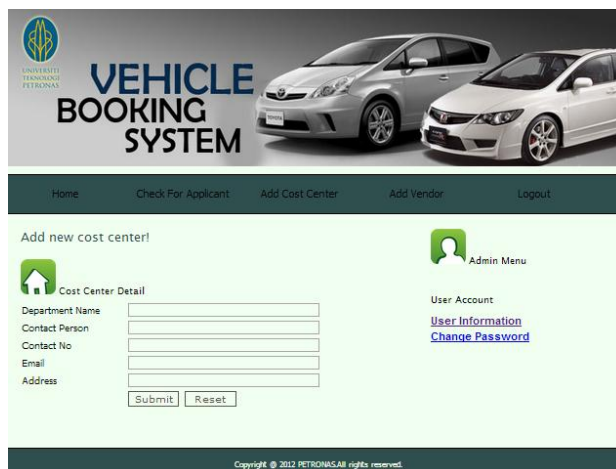


The screenshot shows the 'Add Vendor' page of the 'VEHICLE BOOKING SYSTEM'. The header includes the University Teknologi PETRONAS logo and the system title. A navigation bar contains links for Home, Check For Applicant, Add Cost Center, Add Vendor, and Logout. The main content area is titled 'Add new vendor!' and contains a 'Vendor Detail' form with the following fields: Vendor Name, Contact Person, Contact No, Email, Website, and Address. Below the form are 'Submit' and 'Reset' buttons. To the right, there is an 'Admin Menu' section with links for 'User Account', 'User Information', and 'Change Password'. A copyright notice at the bottom reads 'Copyright © 2012 PETRONAS All rights reserved.'

Figure 4.15: Add Vendor Page

### 4.3.2.3 Add Cost Center Page

As approver click Add Cost Center, the page will appear a blank form to be filled by the approver in order to add more cost center to the list. Approver may click the Save Button to save the record.



The screenshot shows the 'Add Cost Center' page of the 'VEHICLE BOOKING SYSTEM'. The header and navigation bar are identical to the previous page. The main content area is titled 'Add new cost center!' and contains a 'Cost Center Detail' form with the following fields: Department Name, Contact Person, Contact No, Email, and Address. Below the form are 'Submit' and 'Reset' buttons. To the right, there is an 'Admin Menu' section with links for 'User Account', 'User Information', and 'Change Password'. A copyright notice at the bottom reads 'Copyright © 2012 PETRONAS All rights reserved.'

**Figure 4.16: Add Cost Center Page**

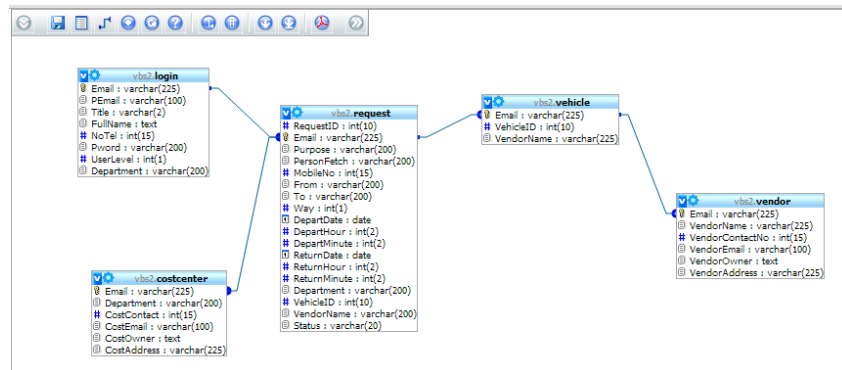
#### 4.4 Database of System

The database system being used in the system is phpMyAdmin. For this project, the author used five tables to be linked together to reduce the complexity of the database. Each table have a specific primary key. The names of the tables of this project are:-

Table Name
Login
Request
Vendor
Vehicle
Cost Center

**Table 4.2 : List of Table Name**

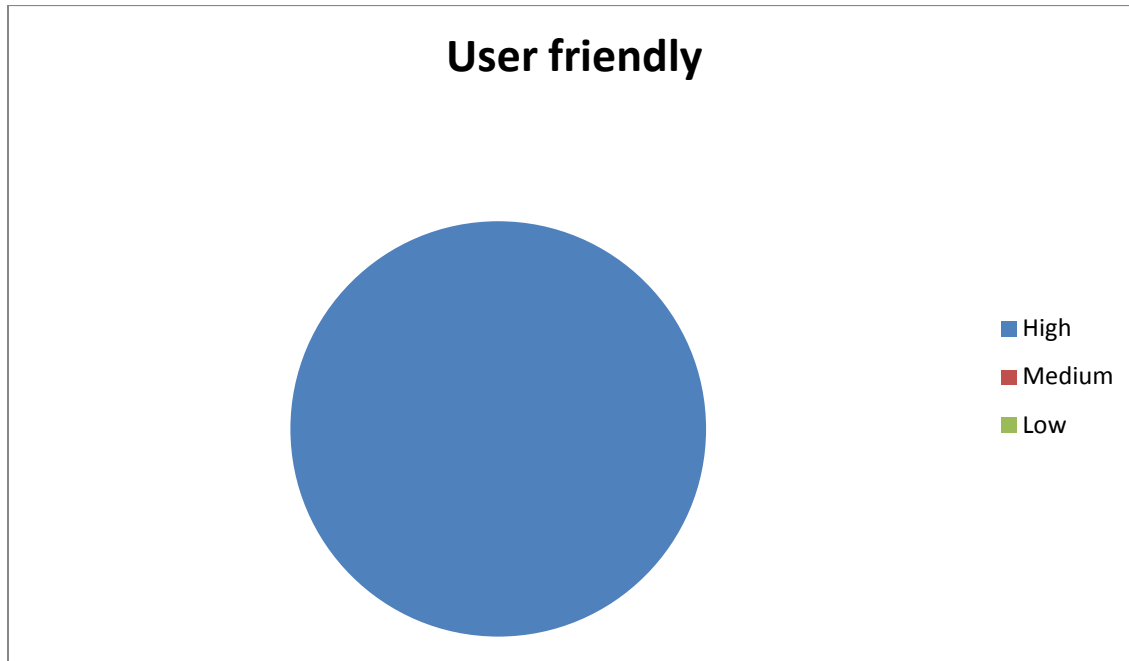
#### 4.4.1 Overall Database for UTP Vehicle Booking System



**Figure 4.17: Relationship of Overall Database**

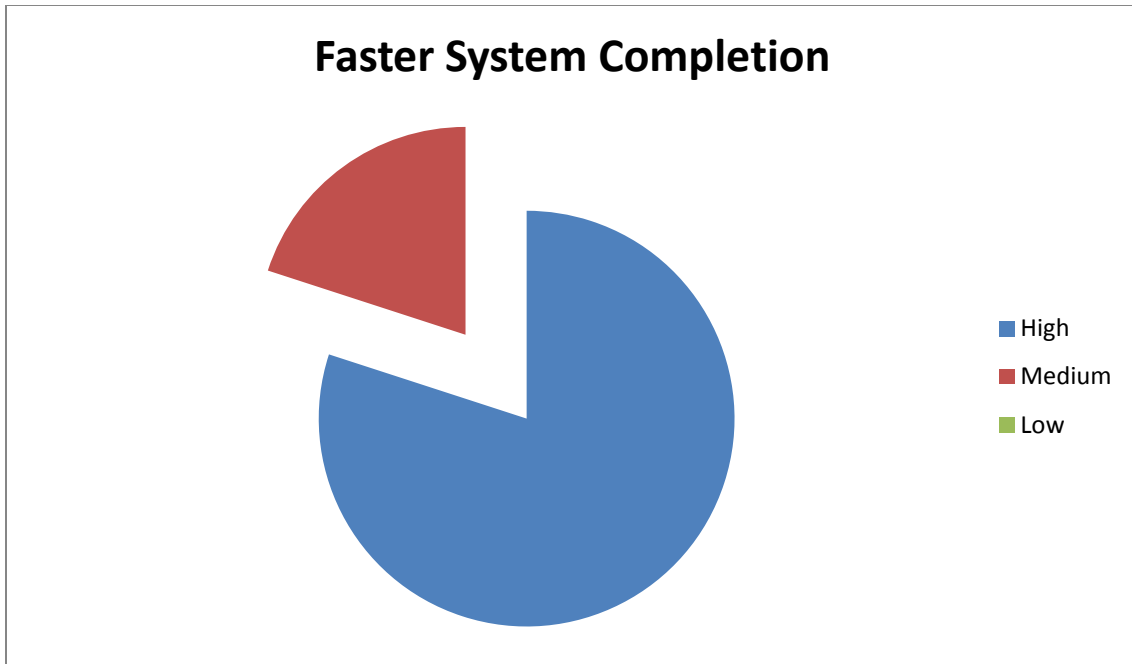
## 4.5 System Testing

A usability testing was successfully conducted to test the usability of Vehicle Booking System. Two staffs from HRM UTP and three lecturers were asked to use the web based system. There are several aspect being tested during the testing process.



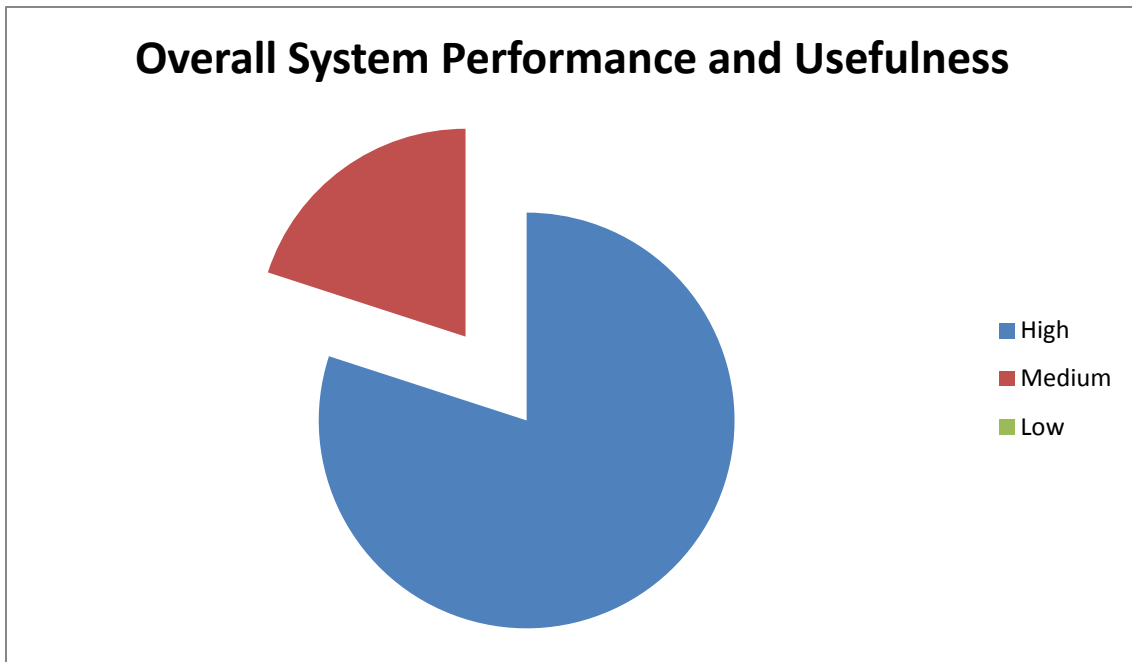
**Figure 4.18: Result of testing for user friendly element**

Figure 4.18 shows 100% of the respondent agree that the system is user friendly. The system is easy to be use and the instructions conveyed are clear. No users who felt clueless while using the system.



**Figure 4.19: Result of testing for faster system completion**

Figure 4.19 illustrates four users agreed that the system need less effort to be completed. This is based on three click rules where the users need to click less than three times to go to the respective page.



**Figure 4.20: Result of overall system performance and usefulness**

Figure 4.20 shows that four out of five users agreed that the overall system and website features ease the user, gives impact to them and gives the effective ways of enhancement the vehicle booking process.



## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Conclusion

Nowadays the evolvement of computerized system is rapid. Many applications were developed to ease the world wide users and provide them maximum satisfaction. In completing the user requirements, the stakeholders involve in the system were interviewed. Apart from that, research on the current existed computerized system was done in order to study the limitation occur to the existed system.

The target of the author towards the system is to overcome the limitation of the current manual system in Vehicle Booking System in UTP. With the ability to make request with the usage of automate system, the author anticipate to reduce the burden of the lecturers and HRM staff in conducting their task. The author expects that the developing phase will be run as planned, thus the project will be able to be closed according to the UTP Final Year Project 2 timeline.

This project involves development of website that enhances the manual system of vehicle booking process in Universiti Teknologi PETRONAS into a web based system. It involves the information about booking process in UTP and provides online application form. There are two modules of main user involves in this system which are admin and student.

As a conclusion, Vehicle Booking System will be a first vehicle booking website in UTP. All the objectives have been met after completing the website and conducting the testing with real users. The website can be maintained by updating the list of applicants and change the pictures and information regarding the booking application to the current one since the applicants needs to use the forms and require updated information regarding the booking process.

## **5.1 Recommendation**

There are several recommendations that the author would like to propose for future enhancement. Firstly the author would like to suggest that the website is be able to automatically send short message system (SMS) notification to the requester (staff). This enables the requester to receive quick update where nowadays hand phone is a need for human. Apart from that, the author also would like to add the student body such as Student Representative Council, Rakan Masjid, Sekretariat Rakan Muda and Residential College Support Unit to be register as user. These student bodies might require transportation for conducting their event. In line with that, the author suggest that the system to integrate the vehicle under the Property Management and Maintenance responsibility to be offered and manage under this system as well.

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# APPENDICES

## Interview Report with HRM Department

Interview Notes Approved By: Mr Aminurrasyid

**Person Interviewed : Staff of Human Resource Management Department of UTP**

**Interviewer : Nur Zarith Sufia binti Zulkeply**

### **Purpose of Interview:**

- Understand the current system used by HRM department.
- Determine information requirements for future system.
- Identify the problem arise from the existing system.

### **Summary of Interview :**

- The needs of replacing the manual system into an automate system which is web-based system to minimize the complexity of manual process.
- The issues faced by the system administrators:
  1. The manual and time consuming process of updating the booking applications.
  2. Manual system using Microsoft Excel and Word provide limited features just for entering, searching and printing data.
  3. Manual system using email for booking process consumes a lot of repetitive work.
  4. Loss of documentation file for future reference due to too many papers and manual process involved.
- The criteria of the new system that help to simplify the task of the system administrator are:
  1. Using the web-based system to replace the manual system.

## Meeting Report with HRM Department

Meeting Notes Approved By: Mr Aminurrasyid

**Person Met : Staff of Human Resource Management Department of UTP**

**Carried by : Nur Zarith Sufia binti Zulkeply**

**Purpose of Meeting:**

- Propose the design of GUI.
- Clarify the proposed GUI met the user expectation.
- Identify the problem arise from the proposed GUI.

**Summary of Meeting:**

- The proposed GUI simplifies the work load of the user.
- The proposed GUI maintained the current process of vehicle booking but being transformed into automated process.
- The criteria of the new system that help to simplify the task of the system administrator are:
  1. An added function that can extract the booking record to be downloaded to Excel form for future reference.

# LOGIN TABLE

Field	Type	Collation	Attributes	Null	Default	Extra	Action
Email	varchar(225)	latin1_swedish_ci		No	None		
PEmail	varchar(100)	latin1_swedish_ci		No	None		
Title	varchar(2)	latin1_swedish_ci		No	None		
FullName	text	latin1_swedish_ci		No	None		
NoTel	int(15)			No	None		
Pword	varchar(200)	latin1_swedish_ci		No	None		
UserLevel	int(1)			No	None		
Department	varchar(200)	latin1_swedish_ci		No	None		

## Attribute of Login Table

	Email	PEmail	Title	FullName	NoTel	Pword	UserLevel	Department
	admin	admin@petronas.com.my	Mr	Admin Staff	132226654	admin	2	Human Resource Management
	azman	azman@petronas.com.my	Mr	Azman Taib	132376184	azman	3	Management & Humanities
	staff	staff@petronas.com.my	Mr	Staff	132226654	staff	3	Management & Humanities
	zaza	zaza@petronas.com.my	Ms	Zarith Sufa	132226654	zaza	3	Management & Humanities

## Record of Login Table

# REQUEST TABLE

Field	Type	Collation	Attributes	Null	Default	Extra	Action
RequestID	int(10)			No	None		
Email	varchar(225)	latin1_swedish_ci		No	None		
Purpose	varchar(200)	latin1_swedish_ci		No	None		
PersonFetch	varchar(200)	latin1_swedish_ci		No	None		
MobileNo	int(15)			No	None		
From	varchar(200)	latin1_swedish_ci		No	None		
To	varchar(200)	latin1_swedish_ci		No	None		
Way	varchar(200)	latin1_swedish_ci		No	None		
DepartDate	int(1)			No	None		
DepartDate	date			No	None		
DepartHour	int(2)			No	None		
DepartMinute	int(2)			No	None		
ReturnDate	date			No	None		
ReturnHour	int(2)			No	None		
ReturnMinute	int(2)			No	None		
Department	varchar(200)	latin1_swedish_ci		No	None		
VehicleID	int(10)			No	None		
VendorName	varchar(200)	latin1_swedish_ci		No	None		
Status	varchar(20)	latin1_swedish_ci		No	None		

## Attribute of Request Table

	RequestID	Email	Purpose	PersonFetch	MobileNo	From	To	Way	DepartDate	DepartHour	DepartMinute	ReturnDate	ReturnHour	ReturnMinute	Department	VehicleID	VendorName	Status
	1	staff	Holiday	Azman	139997889	Ipoh	UTP	1	2011-05-11	10	30	2011-05-11	14	30	Management & Humanities	1	Syarikat Kendaraan StarMax	Unprocess

## Record of Request Table



## VENDOR TABLE

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> VendorName	varchar(225)	latin1_swedish_ci		No	None		
<input type="checkbox"/> VendorContactNo	int(15)			No	None		
<input type="checkbox"/> VendorEmail	varchar(100)	latin1_swedish_ci		No	None		
<input type="checkbox"/> VendorOwner	varchar(200)	latin1_swedish_ci		No	None		
<input type="checkbox"/> VendorAddress	varchar(225)	latin1_swedish_ci		No	None		
<input type="checkbox"/> VendorWebsite	varchar(200)	latin1_swedish_ci		No	None		
<input type="checkbox"/> VendorStatus	varchar(200)	latin1_swedish_ci		No	None		

Check All / Uncheck All With selected:

Print view Relation view Propose table structure Change

Add 1 field(s) At End of Table At Beginning of Table After VendorName Go

### Attribute of Vendor Table

+ Options

	VendorName	VendorContactNo	VendorEmail	VendorOwner	VendorAddress	VendorWebsite	VendorStatus
<input type="checkbox"/>	Syarikat Kenderaan StarMax	342564250	request@starmax.com.my	Mr Lee Tan Yong	Ground Floor, Plaza Ampang Jaya, Jln Mewah 5, Tama...	www.starmax.com.my	Active
<input type="checkbox"/>	Syarikat Kenderaan Limosine	342511187	request@limosine.com.my	Mr Ahmad Mazuki	26 Jalan Kubis, Taman Goodwood, Off Jalan Kuchai L...	-	Active

Check All / Uncheck All With selected:

Show 30 row(s) starting from record # 0

in horizontal mode and repeat headers after 100 cells

### Record of Vendor Table

## VEHICLE TABLE

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> VehicleID	varchar(200)	latin1_swedish_ci		No	None		
<input type="checkbox"/> VendorName	varchar(225)	latin1_swedish_ci		No	None		
<input type="checkbox"/> Type	varchar(20)	latin1_swedish_ci		No	None		

Check All / Uncheck All With selected:

Print view Relation view Propose table structure

Add 1 field(s) At End of Table At Beginning of Table After VehicleID Go

### Attribute of Vehicle Table

+ Options

	VehicleID	VendorName	Type
<input type="checkbox"/>	1	Syarikat Kenderaan StarMax	MPV
<input type="checkbox"/>	2	Syarikat Kenderaan StarMax	Honda Civic
<input type="checkbox"/>	3	Syarikat Kenderaan Limosine	Toyota Camry

Check All / Uncheck All With selected:

Show 30 row(s) starting from record # 0

in horizontal mode and repeat headers after 100

### Record of Vehicle Table

## COST CENTER TABLE

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> Department	varchar(200)	latin1_swedish_ci		No	None		
<input type="checkbox"/> CostContactNo	int(15)			No	None		
<input type="checkbox"/> CostEmail	varchar(100)	latin1_swedish_ci		No	None		
<input type="checkbox"/> CostOwner	text	latin1_swedish_ci		No	None		
<input type="checkbox"/> CostAddress	varchar(225)	latin1_swedish_ci		No	None		
<input type="checkbox"/> CostStatus	varchar(200)	latin1_swedish_ci		No	None		

Check All /  Uncheck All With selected:

[Print view](#) [Relation view](#) [Propose table structure](#)

1 field(s)  At End of Table  At Beginning of Table  After Department

## Attribute of Cost Center Table

+ Options						
	Department	CostContactNo	CostEmail	CostOwner	CostAddress	CostStatus
<input type="checkbox"/>	Management & Humanities	74316698	suzilyana@petronas.com.my	Ms Suzi Liyana	Management & Humanities Department, UTP	Active
<input type="checkbox"/>	Civil Engineering	79987123	fauzan@petronas.com.my	Mr Fauzan Ghazali	Civil Engineering Department, UTP	Active
<input type="checkbox"/>	Petroleum Geoscience	79951652	kamilmizan@petronas.com.my	Mr Kamil Hamizan	Petroleum Geoscience Department, UTP	Active

Check All /  Uncheck All With selected:

30 row(s) starting from record # 0

in horizontal mode and repeat headers after 100 cells

## Record of Cost Center Table