JABATAN PEMBANGUNAN & PENGURUSAN HARTA TRANSPORTATION MANAGEMENT SYSTEM (JTMS) BY APPYING USABILITY HEURISTIC PRINCIPLE

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ABSTRACT

Jabatan Pembangunan & Pengurusan Harta (JPPH) is one of department in Universiti Malaysia Pahang (UMP) that is responsible to manage the asset or property of the university including university's transportation. It manages the operational of the transportation in matter of booking transport. There are several problems identified when using the conventional system when user want to borrow the transport, such as time to book is limited to working hours only, the manual system that has been used before using too much paper and this can cause some missing data, user has to go to the JPPH to book transport and they cannot check the availability of the transport immediately. As for the solution to all problems above, Jabatan Pembangunan & Pengurusan Harta Transportation Management System (JTMS) is developed to manage the operational of the transportation in matter of booking process. JTMS is a web-based application system. The significance of this system is allows the staff and student to checking the availability of transportation immediately. All application data will be stored in one proper database and is more appropriate approach compared to the traditional way where all the data is written on the paper. To develop this system, Rapid Application Design (RAD) model had been chosen as a methodology. Hopefully this system can be really helpfully and handy to the user.

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Jabatan Pembangunan & Pengurusan Harta (JPPH) is one of department in Universiti Malaysia Pahang (UMP) that is responsible to manage the asset or property of the university including university's transportation. It manages the operational of the transportation in matter of booking transport. There are several problems identified when using the conventional system when user want to borrow the transport, such as time to book is limited to working hours only, the manual system that has been used before using too much paper and this can cause some missing data, user has to go to the JPPH to book transport and they cannot check the availability of the transport immediately. As for the solution to all problems above, Jabatan Pembangunan & Pengurusan Harta Transportation Management System (JTMS) is developed to manage the operational of the transportation in matter of booking process. JTMS is a web-based application system. The significance of this system is allows the staff and student to checking the availability of transportation immediately. All application data will be stored in one proper database and is more appropriate approach compared to the traditional way where all the data is written on the paper. To develop this system, Rapid Application Design (RAD) model had been chosen as a methodology. Hopefully this system can be really helpfully and handy to the user.

ABSTRAK

Jabatan Pembangunan & Pengurusan Harta (JPPH) adalah salah satu jabatan di Universiti Malaysia Pahang (UMP) yang bertanggung jawab untuk menguruskan aset atau milik universiti termasuk kenderaan. Ini termasuklah menguruskan operasi pengangkutan dalam hal tempahan kenderaan. Ada beberapa masalah dikenalpasti apabila menggunakan sistem konvensional ketika pengguna ingin meminjam kenderaan, seperti waktu untuk menempah terhad pada waktu kerja saja, sistem manual yang digunakan sebelum ini menggunakan terlalu banyak kertas dan ini boleh menyebabkan beberapa data hilang, pengguna perlu pergi ke JPPH untuk mebuat tempahan kenderaan dan mereka tidak boleh menyemak dengan segera status kenderaan yang hendak digunakan. Sebagai penyelesaian untuk semua masalah di atas, Jabatan Pembangunan & Pengurusan Harta Sistem Pengurusan Pengangkutan (JTMS) dibangunkan untuk menguruskan operasi pengangkutan yang dalam hal tempahan kenderaan. JTMS adalah sebuah sistem aplikasi berasaskan web. Kepentingan sistem ini adalah membolehkan kakitangan dan pelajar untuk menyemak dengan segera status kenderaan yang hendak di tempah. Semua data aplikasi akan disimpan dalam satu pangkalan data dan pendekatan yang lebih tepat berbanding dengan cara tradisional dimana semua data yang tertulis di atas kertas. Untuk menbangunkan sistem ini, Rapid Application Design (RAD) model telah dipilih sebagai metodologi. Semoga sistem ini dapat membantu dan mudah ditangani pengguna.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	TITLE PAGE	
	SUPERVISOR'S DECLARATION	ii
	STUDENT'S DECLARATION	iii
	DEDICATION	vi
	ACKNOWLEDGEMENT	v
	ABSTRACT	vi
	ABSTRAK	vii
	TABLE OF CONTENTS	viii
	LIST OF TABLES	xi
	LIST OF FIGURES	xiii
	LIST OF APPENDIXES	xiv
1	**INTRODUCTION**	1
	1.1 Project Background	1
	1.1.1 Module Overview	6
	1.2 Problem Statement	7
	1.3 Objectives	8
	1.4 Scopes	9
	1.5 Organizational thesis	10
2	**LITERATURE REVIEW**	**11**
	2.1 Introduction	11
	2.2 Project Overview	11

2.2.1 Transportation 12
2.2.2 Transportation Management 12
2.2.3 Heuristic Principle 13
2.3 Explanation of Implementing Usability Heuristic Principle 15
2.4 Existing System 25
2.5 References System 26
2.5.1 Comparison of the systems 27
2.5.1.1 http://www.publiccab.com/ 27
2.5.1.2 http://www.avis.com.my/ 31
2.5.1.3 http://www.e-erac-online.com/default.aspx 33
2.6 Conclusion 35

3 **METHODOLOGY** 36
3.1 Introduction 36
3.2 Project Methodology 37
3.3 Rapid Application Development 38
3.3.1 Phases in RAD 40
3.3.1.1 Requirements Planning 41
3.3.1.2 User Design 42
3.3.1.2.1 Overall System 43
3.3.1.2.2 Registration Module 45
3.3.1.2.3 Booking Module 55
3.3.1.2.4 Scheduling Module 57
3.3.1.2.5 History Module 59
3.3.1.2.6 Report Generation Module 60
3.3.1.2.7 Database Design 61
3.3.1.2.8 User Interface Design 63
3.3.1.3 Construction 64
3.3.1.4 Cutover 65
3.4 Project Requirement 66
3.4.1 Software Requirement 66
3.4.2 Hardware Requirement 67

	3.5	Project Schedule and Milestones	68
	3.6	Conclusion	68
4	**IMPLEMENTATION**		70
	4.1 Introduction		70
	4.2 Database Construction		71
	4.3 User Interface Construction		73
	4.4 Implementation of Usability Heuristic Principle		91
	4.5 Conclusion		95
5	**RESULT AND DISCUSSION**		96
	5.1 Introduction		96
	5.2 Test result		96
	5.3 Advantages & Disadvantages		97
	5.3.1 Advantages		97
	5.3.2 Disadvantages		98
	5.4 Constraint		98
	5.4.1 System Constraint		98
	5.4.2 Developer Constraint		99
	5.5 Assumption & further research		99
	5.6 Conclusion		100
6	**CONCLUSION**		101
	6.1 Conclusion		101
7	**LIST OF TABLE**		xi
8	**LIST OF FIGURE**		xii
9	**LIST OF APPENDIX**		xvi

LIST OF TABLE

TABLE NO	TITLE	PAGE
3.1	User Data Dictionary	61
3.2	Vehicle Data Dictionary	61
3.3	Booking Data Dictionary	62
3.4	Driver Data Dictionary	62
3.5	Schedule Data Dictionary	63
3.6	Software Requirement in developing JTMS	66
3.7	Hardware specification used to develop JTMS	67

LIST OF FIGURE

FIGURE NO	TITLE	PAGE
2.1	Registration form for new user of AHRS	16
2.2	Message dialog that appear when click on button Register	16
2.3	The main interface of AHRS	17
2.4	The About Us interface	18
2.5	The Accommodation interface	19
2.6	Add inventory form of SCEIS	20
2.7	The reservation interface of SCEIS	21
2.8	The Contact Us interface of SCEIS	22
2.9	The error handling of SCEIS	23
2.10	The option for demo of using AHRS	24
2.11	Booking form of publiccab.com	27
2.12	Confirmation Details	28
2.13	Booking form successfully sent	28
2.14	Feedback form	29
2.15	Error handling	30
2.16	Main interface of avis.com	31
2.17	Booking interface	32
2.18	Display Reservation interface	32
2.19	Main interface of e-erac-online.com	33
2.20	Interface for details of transport	34
3.1	Phases in SDLC	37
3.2	Phases in RAD	40
3.3	JTMS Use Case Diagram	43
3.4	Sequence Diagram for JPPH Transportation Management	44

3.5	User Account Registration Use Case Diagram	45
3.6	Sequence Diagram for User Account Registration	46
3.7	Cancel User Registration and Exit to the Log in interface	47
3.8	Proceed to the Login Interface	48
3.9	Invalid Information	49
3.10	Transportation Registration	50
3.11	Sequence Diagram for Transport Registration	51
3.12	Cancel Transport Registration and Exit to the Main Menu	52
3.13	Update Status of Transport	53
3.14	Delete the Break Down Transport	54
3.15	Booking Transportation Use Case Diagram	55
3.16	Sequence Diagram of Booking Transportation	56
3.17	Cancel Booking	56
3.18	Scheduling Transportation Use Case Diagram	57
3.19	Sequence Diagram of Scheduling Transportation	58
3.20	History Use Case Diagram	59
3.21	Sequence Diagram of History	59
3.22	Generate Report Use Case Diagram	60
3.23	Sequence Diagram of Report Generation	60
3.24	Prototype of JTMS	64
4.1	Table structure for user table	71
4.2	Table structure for vehicle table	71
4.3	Table structure for booking table	72
4.4	Table structure for driver table	72
4.5	Table structure for schedule table	73
4.6	Main interface of JTMS	74
4.7	Connection to database	74
4.8	Add new user to database	75
4.9	New user registration	75
4.10	Validation data	76
4.11	Incomplete data filled in	76
4.12	Verified data	77
4.13	Login section	78

4.14	After Logout	78
4.15	Blank username&password	78
4.16	Wrongusername&password	78
4.17	Blank username	78
4.18	Blank password	78
4.19	Student/Staff home interface	79
4.20	User booking form	79
4.21	Booking Confirmation	80
4.22	Status of new booking (process)	80
4.23	Admin home interface	81
4.24	Booking Interface	81
4.25	Booking Details	82
4.26	Driver Selection	82
4.27	Add trip to schedule	82
4.28	Transport that has booked by user	83
4.29	Status of user booking (approved)	83
4.30	Schedule of trip	83
4.31	New booking on same date	84
4.32	The date selected is unavailable	84
4.33	Driver home interface	85
4.34	Schedule Interface (driver)	85
4.35	User List	86
4.36	Confirm delete code	86
4.37	Delete user source code	86
4.38	List of vehicle	87
4.39	Edit vehicle information	87
4.40	Update vehicle source code	87
4.41	Data Updated	88
4.42	List of report	88
4.43	Search source code	88
4.44	Details of Report	89
4.45	JTMS statistic	89
4.46	Booked transport statistic's source code	90

4.47	Booking status statistic's source code	90
4.48	Login section	91
4.49	Booking interface	92
4.50	Schedule interface	92
4.51	New User Registration form	93
4.52	Booking interface	93
4.53	History interface	94
4.54	New User Registration form	94

LIST OF THE APPENDIXES

APPENDIX	TITLE	PAGE
A	Gantt Chart	103
B	References Chapter 2	105
C	Manual Booking Form	107
D	Review Checklist	110

CHAPTER 1

INTRODUCTION

1.1 Project Background

Jabatan Pembangunan & Pengurusan Harta (JPPH) is one of department in Universiti Malaysia Pahang (UMP) that is responsible to do the development works, maintenance of buildings and facilities and also manage the asset or property of the university including university's transportation. At first of establishment of KUKTEM (now known as Universiti Malaysia Pahang) in 2002, JPPH has been operating on a small scale with the functions performed by the Unit Teknikal & Unit Kenderaan. Both of these units do all the roles including civil works, electrical, mechanical, property management & logistic university. Appropriate to the increasing number of staff and physical expansion of UMP they need its organizational structure for management of development & property to be more effective. Then, three main parts has been created, namely:

i. Bahagian Pentadbiran & Pengurusan Harta
ii. Bahagian Pembangunan & Rekabentuk
iii. Bahagian Penyelenggaraan

Each part is headed by an Engineer/Architect/Assistant Registrar and supported by a number of technical and administrative support staff. Bahagian Pentadbiran & Pengurusan Harta is created to manage the financial and administrative, transportation and unit of council since it is divided to two units

which is Unit Pentadbiran & Kewangan and Unit Pengurusan Kenderaan. Unit Pengurusan Kenderaan plays roles such as:

i. Secretariat of meeting with drivers.
ii. Manage the booking of transportation for students and staff activities.
iii. Prepare work schedule for driver based on student's transportation.
iv. Provides movement schedule and confirm the driver's path.
v. Check and verify all the claims for overtime and the driver's path.
vi. Managing transportation rental for students and staff activities.
vii. Managing transportation rental from outsider (schools, statutory unit, alliance's agencies and state).
viii. Manage and verify the statements of fuel for university's official transportation every month.
ix. Manage and execute the process of reload the Touch n Go card for university's official transportation.
x. Manage all the matter and records of summons for UMP's official transportation.

Therefore, Jabatan Pembangunan & Pengurusan Harta Transportation Management System (JTMS) is developed to manage the operational of the transportation in matter of booking process.

JPPH Transportation Management System (JTMS) is a web-based application system. Users for this system consist of staff and students of Universiti Malaysia Pahang and also driver of JPPH. Students and staffs can book the transport belong to Universiti Malaysia Pahang using this system. The significance of this system is allows the staff and student to checking the availability of transportation for book it. All application data will be stored in one proper database and is more appropriate approach compared to the traditional way where all the data is written on the paper. Before making any book, user needs to register first to the system.

JTMS make it easier to update the current status or condition of transport, since details about transportation is saved in this system. At first, administrator will register the new transport available for book by students or staffs of Universiti Malaysia Pahang. In addition, administrator also can update and delete the transport information such as the availability to the only transportation that is in a good condition for the long distance journey, for user to use. Administrator can search the transport by registration number and then update. Administrator can disable or remove the transport that is not in a good condition from the list of transportation that available to book.

Searching and any update to the system will be done faster, hence reduces the file accessing time. Since everything will be saved in the computer, no paper is required. This will save cost in spending of file storage. Data can be easily shared among users who are authorized. User can book anytime and from anywhere they want as long they have computer and internet connection. JPPH do not have to worried anymore about the data will be damaged by any vulnerable such as natural disaster, and data thieves. Data will be secured by placing security measures such as using of password, and limit the user authorization. The JTMS is more appropriate with nowadays computerized era.

In today's world of fast development and deployment of technology, Human Computer Interaction (HCI) is one of important things that needs to consider in develops a functional system that can satisfy user. As we know, technologies growth makes user wish for a system that can assist them in their daily life. With this growing demand, it is recommended to develop a system that can achieve user's target and expectation. Therefore, JTMS is developed to fulfill user needs that want a simple and learnable system that can please them by implementing certain HCI elements. Usability is a key issue in human-computer interaction (HCI) since it is the aspect that commonly refers to quality of the user interface.

JTMS will enhancing a pleasant user experience in using the system since the HCI's main purpose include of ensuring system functionality and usability, providing effective user interaction support. The most important thing is to achieve both organizational and individual user effectiveness and efficiency in operational related to booking transportation. Therefore, to improve the JTMS usability, it will be developed by apply the Heuristic Principle. This can make sure HCI is really implemented on this system which is to the effectiveness and efficient way of usability. This is because the factors that contributing to failures in HCI including visibility of system status, match between system and real world, user control and freedom, consistency and standards, error prevention, recognition rather than recall, and flexibility and efficiency of use.

The Heuristic Principle helps to improve usability of a system in the user interface (UI) design. The Usability Heuristic Principle introduced by Jakob Nielsen will be used in the field of interface design for JTMS consists of:

1. Visibility of system status
The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

2. Match between system and the real world
The system should follow real-world conventions, making information appear in a natural and logical order.

3. User control and freedom
Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

4. Consistency and standards
Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

5. Error prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place.

6. Recognition rather than recall

Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

7. Flexibility and efficiency of use

Accelerators -- unseen by the novice user -- may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

8. Aesthetic and minimalist design

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

9. Help users recognize, diagnose, and recover from errors

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

10. Help and documentation

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

1.1.1 Module Overview

The JTMS is made up with six main modules which are: Registration, Login, Booking, History, Scheduling, and Report Generation.

i. Registration

There will be a new user registration interface for first time users. After registration phase, users are able to enter to the system to continue what they want in the applications that are available. For staff and student they can apply to book the transport. For administrator, they are allowed to add new user and available transport with the details to the system. The details of transport such as registration number, maximum passengers, transport type, and who are the user of the transport which means, user that can book and use the transport. All the details as JPPH database record and can help admin to decide the selected transport to be available on this system.

ii. Login

Once user has registered, they can login to the system by enter username and password. If user inserts wrong username or password, system will prompt them. The system also will prompt user if they left the field blank, and straight click on Log in button, either they forget to insert username or password.

iii. Booking

User will take a look on available transport and if the transport available, user has to fill up the booking form in booking module. Then, user just waits for admin approval. Before the approval to book the transport, administrator will check the transport details to make sure it is in a good condition for user to book. For admin, there is a list of booking from user and they will approve the booking based on what activities user will use the transport.

iv. History

In this module, user can view list of booking that they had made previously. It is include all that has been approved, still in process or booking that not approved.

v. Scheduling

Once Admin has chosen a driver, the task will add to the driver's schedule. Driver can view their working schedule on schedule module while staff and student will have schedule of trip on this module.

vi. Report Generation

Reports containing quantity of transport and booking, transport status whether available or not and other details will be generated. There is also statistic of JPPH transportation which is transport that has been book, it will count total of booked transport and sort by vehicle type. Other than that, is booking status statistic, it count total of the booking status sort by the status which are process, approved, and decline.

1.2 Problem Statement

The main idea of this project is develop transportation management system that able staff to manage UMP's transportation and for student and staff book transport. This system is upgrade from manual system to computer system to make booking process better and searching data process can be faster and systematic which is the end user had to fill the forms and wait the next progress onwards. The system that is developing has security features such as only certain people that had the right to access the system and the data that have been enter is secured. This system can also save some space by filing the data, money by limit the paper and file using and time to searching data.

The justification of developing this system is to provide the effectiveness of the transport booking process made by the student and staff. The need for the system arises as a result of these sets of problem faced by users in the current manual way performing related task. Problems are identified in manual transportation management:

i. The manual system that has been used before using too much paper and this can cause some missing data.
ii. It also will take much time for user to update, booking, and searching the data.
iii. User has to go to the JPPH to book transport.
iv. The time to book is limited to working hours only.
v. User cannot check the availability of the transport immediately.
vi. Not systematic and time consuming.
vii. Every stage of application of the current system is conducted manually which includes filling JPPH transportation booking application form, recording information of users and JPPH transportations and so on.
viii. All the documents are filled up and kept in the rack which waste resources such as papers, pens and space for storing those files.

1.3 Objective

The objectives of the project are:

i. To computerize the manual task for the operational of Jabatan Pembangunan dan Pengurusan Harta (JPPH) Transportation.
ii. Improving the appearance and contents of the previous system that compatible with the operational of JPPH by applying the Usability Heuristic Principle.

1.4 Scope

This JPPH Transportation Management System (JTMS) involve two elements as target users. They are front-end (user) and back-end (administrator). These users have different role and responsibilities.

i. The administrator of JTMS

Administrator is the person that has a privilege to control the users and manage the transport through this system. Administrator is also the only person that can gives the permission or approval for user to use the transport. After approve the booking admin will choose available driver to drive the transport. Administrator can register the new transport information to the database also update and delete the transport information. The administrator also can update information related to transportation information. The administrator can also add and update user information as well as looking up for any record. Administrator can generate reports containing quantity of transport, transport that is available and not available to book will be generated.

ii. The students/ staffs of UMP

Students/Staffs need to register his/her information to the database via this system for first time use in user registration interface. Then they must log in to the system in the interface to precede the booking process. Students/Staffs can view transportation status, either free or not. Then they have to wait for the administrator approval. Once the booking application has been approved, their trip will add to schedule. User also can view list of booking they has made in history module.

iii. The driver of JPPH

Once Admin has chosen a driver, the task will add to the driver's schedule.

Driver can view their working schedule on schedule module. The details provided in schedule are vehicle, date to go and the destination.

1.5 Organizational Thesis

This first chapter reviews on the description of the project and some related background information on the project. Besides that, this chapter observes the problem statement of this project to give a clear insight of what is the objective and scope of the project. This chapter will become the guideline to all the work that is to be carried out in the later stage. The second chapter will discuss on the literature review. The third chapter will detail about methodology and approach used. The next chapters, which chapter four will explain about the implementation of system application design include the flow of system and usability heuristic principle that has been implementing in JTMS. Chapter five will elaborate more on result and discussion. The last chapter will conclude the whole system and suggestion for the improvement of the system.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The second chapter reviews on the related literatures that support the system which is the effective evaluation of selected documents on this research topic. A review may form an essential part of the research process and consist of critical synthesis of previous research. . Besides that, the statements or quotations that are related to this project also covered in this chapter. The evaluation of the literature leads logically to the problem statement.

2.2 Project Overview

Literature review will review the critical points of current knowledge on a particular topic. Therefore, the purpose of the literature review is to find, read and analyze the literature or any works or studies related to this system.

Before develop the Jabatan Pembangunan & Pengurusan Harta Transportation Management System (JTMS), it is necessary to well understand about all information related.