WEB-BASED HOUSE RENTAL APPLICATION SYSTEM

NURUL AFIQAH BINTI SAMSURI

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN

JUDUL: WEB-BASED HOUSE RENTAL APPLICATION SYSTEM

SESI PENGAJIAN: 2021/2022

Saya: NURUL AFIQAH BINTI SAMSURI

mengaku membenarkan tesis Projek Sarjana Muda ini disimpan di Perpustakaan Universiti Teknikal Malaysia Melaka dengan syarat-syarat kegunaan seperti berikut:

1. Tesis dan projek adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. * Sila tandakan (✓)

_____	SULIT	(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)
_____	TERHAD	(Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi / badan di mana penyelidikan dijalankan)
___/___	TIDAK TERHAD	

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

nurul afiqah

(TANDATANGAN PELAJAR)

Alamat tetap: 310, Jalan Cenderawasih

19, TTDI 5, 84000 Muar, Johor

Tarikh: 13 September 2021

(TANDATANGAN PENYELIA)

EMALIANA KASMURI

Nama Penyelia

Tarikh: 13 September 2021

CATATAN: * Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa.

WEB-BASED HOUSE RENTAL APPLICATION SYSTEM

NURUL AFIQAH BINTI SAMSURI

This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Software Development) with Honours.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021

DECLARATION

I hereby declare that this project report entitled

WEB-BASED HOUSE RENTAL APPLICATION SYSTEM

is written by me and is my own effort and that no part has been plagiarized

without citations.

STUDENT : nurul afiqah Date : 13/9/2021

(NURUL AFIQAH BINTI SAMSURI)

UTeM
اونيۏرسيتي تيکنيکل مليسيا ملاک
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

I hereby declare that I have read this project report and found

this project report is sufficient in term of the scope and quality for the award of

Bachelor of Computer Science (Software Development) with Honours.

SUPERVISOR : Emma. Date : 13 September 2021

(EMALIANA BINTI KASMURI)

DEDICATION

This project is dedicated to my loving parents, who have always been a source of inspiration for me, giving me strength when I was on the verge of giving up, and who continue to support me morally, spiritually, emotionally, and financially.

To my supervisor, siblings, friends, and classmates all offered words of support and guidance to help me finish this project.

Finally, I'd like to express my gratitude to the Almighty God for his guidance, strength, and protection in providing us with a healthy life.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ACKNOWLEDGEMENTS

First and foremost, I want to thank God the Almighty for showering me with blessings throughout my life, allowing me to successfully complete the project.

I would like to express my deep and sincere gratitude to my supervisor, PN.Emaliana Binti Kasmuri, for giving me the opportunity to do the project and providing invaluable guidance throughout this project. Her vision, sincerity, and motivation have profoundly influenced me. She has taught me the methodology to carry out the project and to present project work as clearly as possible. It was a great privilege and honour to work and study under her guidance.

Furthermore, I would like to express my gratitude to my evaluator, Dr Nor Hafeizah Binti Hassan, for providing me with critical recommendations and evaluating my work.

Lastly, I am extremely grateful to my parents for their prayers, care and sacrifices for educating and preparing me for my future. I am grateful to my friends and classmates for their patience, prayers, and ongoing support in completing this project.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ABSTRACT

The House Rental Application System is a web-based system to manage the process of renting a house systematically. The majority of landlords and tenants currently use a manual process. The manual process is complicated, time-consuming, and inconvenient, especially for landlords who manage multiple tenants at the same time. It is also hard for the landlord to keep track of the monthly rental payment for every tenant. With the development of this project, it may be possible to solve the current problems that landlords and tenants are experiencing. The purpose of this system is to develop a systematic web application to rent houses to keep all the data regarding the landlord, tenant, houses and payment. The business operation is computerized and systematic by using the House Rental application system. The scope of this project covers the administrator module, landlord module and tenant module. The significance of the project is to develop a web application to rent houses where it can simplify the entire process of renting and viewing, payment and minimize human error.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ABSTRAK

Sistem Permohonan Sewaan Rumah adalah sistem berasaskan web untuk menguruskan proses menyewa rumah secara sistematik.Majoriti tuan-tuan tanah dan penyewa kini menggunakan proses manual. Proses manual adalah rumit dan memakan masa terutamanya bagi tuan-tuan tanah yang menguruskan maklumat penyewa yang banyak pada masa yang sama. Ia juga sukar bagi tuan tanah untuk memantau bayaran sewa bulanan untuk setiap penyewa. Dengan pembangunan projek ini, ia dapat membantu menyelesaikan masalah semasa yang dialami oleh tuan-tuan tanah dan penyewa. Tujuan sistem ini adalah untuk membangunkan aplikasi web yang sistematik untuk menyewa rumah, untuk menyimpan semua data mengenai tuan tanah, penyewa, rumah dan pembayaran. Operasi perniagaan dikomputerkan dan sistematik dengan menggunakan sistem aplikasi Permohonan Sewaan Rumah. Skop projek ini meliputi modul pentadbir, modul tuan tanah dan modul penyewa. Kepentingan projek adalah untuk membangunkan aplikasi web untuk menyewa rumah di mana ia boleh memudahkan keseluruhan proses menyewa dan menguruskan pembayaran dan meminimumkan kesilapan manusia.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

TABLE OF CONTENTS

PAGE

DEDICATION ..... **III**

ACKNOWLEDGEMENTS ..... **IV**

ABSTRACT ..... **V**

ABSTRAK ..... **VI**

TABLE OF CONTENTS ..... **VII**

LIST OF TABLES ..... **XII**

LIST OF FIGURES ..... **XIV**

LIST OF ABBREVIATIONS ..... **XVIII**

CHAPTER 1: INTRODUCTION **20**

1.1 Introduction 20

1.2 Problem Statement 21

1.3 Objective 21

1.4 Scope 22

1.5 Project Significant 23

1.6 Expected Output 23

1.7 Conclusion 23

CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY **24**

2.1 Introduction 24

2.2 Facts and Findings 24

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.2.1 Domain..... 24

2.2.2 Existing System..... 25

2.3 Project Methodology.....27

2.4 Project Requirements..... 30

2.4.1 Software Requirement..... 30

2.4.1.1 Development Tools.....30

2.4.1.2 Operating System.....30

2.4.1.3 Software Tools.....30

2.4.1.4 Web Server..... 31

2.4.2 Hardware Requirement.....31

2.5 Project Schedule and Milestone.....31

2.6 Conclusion..... 33

CHAPTER 3: ANALYSIS..... 34

3.1 Introduction.....34

3.2 Problem Analysis.....34

3.3 Requirement Analysis.....35

3.3.1 Data Requirement..... 35

3.3.1.1 Data Dictionary.....35

3.3.2 Functional Requirement.....40

3.3.2.1 Use Case Diagram..... 41

3.3.3 Non Functional Requirement.....41

3.3.3.1 Data Integrity..... 42

3.3.3.2 Security..... 42

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.3.3.3 Performance.....42

3.4 Conclusion.....42

CHAPTER 4: DESIGN.....43

4.1 Introduction.....43

4.2 High-Level Design.....44

4.2.1 System Architecture.....44

4.2.2 User Interface Design.....45

4.2.3 Database Design.....64

4.2.3.1 Conceptual and Logical Database Design.....64

4.3 Detailed Design.....65

4.3.1 Software Design.....66

4.3.1.1 Login User.....66

4.3.1.2 Manage Landlord.....67

4.3.1.3 Manage Tenant.....70

4.3.1.4 Manage House.....73

4.3.1.5 Manage Category.....76

4.3.2 Physical Database Design.....78

4.3.2.1 Data Definition Language(DDL).....79

4.4 Conclusion.....86

CHAPTER 5: IMPLEMENTATION.....87

5.1 Introduction.....87

5.2 Software Development Environment Setup.....87

5.2.1 Windows 10 Operating System.....87

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

5.2.2 Xampp Version 8.0.3.....88
5.2.3 Visual Studio Version 1.58.2.....88
5.3 Software Configuration Management.....88
5.3.1 Configuration Environment Setup.....88
5.3.2 Version Control Procedure.....89
5.4 Implementation Status.....90
5.5 Conclusion.....91
CHAPTER 6: TESTING.....92
6.1 Introduction.....92
6.2 Test Plan.....92
6.2.1 Test Organization.....92
6.2.2 Test Environment.....93
6.2.3 Test Schedule.....93
6.3 Test Strategy.....94
6.3.1 Classes of Test.....94
6.4 Test Design.....95
6.4.1 Test Description.....95
6.4.2 Test Data.....103
6.5 Test Result and Analysis.....116
6.6 Conclusion.....121
CHAPTER 7: PROJECT CONCLUSION.....122
7.1 Observation on Weakness and Strengths.....122
7.1.1 The Strength of HRAS.....122
7.1.2 The limitation of HRAS.....123

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

7.2 Propositions of Improvement.....123

7.3 Project Contribution.....123

7.4 Conclusion..... 124

REFERENCES.....125

UTeM
اونيۏرسيتي تيکنيکل مليسيا ملاک
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF TABLES

PAGE

Table 2.1 Comparison between the existing system……..…….…….…….24

Table 2.2 Development Tools…….…….…….…..……27

Table 2.3 Operating System…….…….…….…….27

Table 2.4 Software Tools……..…….…….……...…28

Table 2.5 Web Server……..…..…….28

Table 2.6 Hardware Requirement…….…….....……..28

Table 2.7 FYP 1& FYP 2 Milestones…….……..……..……29

Table 3.1 Data Dictionary for User…….…..…….....……32

Table 3.2 Data Dictionary for Tenant…….……..…..…33

Table 3.3 Data Dictionary for Landlord…….……..…..…33

Table 3.4 Data Dictionary for Notifications……..…….…….…..…34

Table 3.5 Data Dictionary for House……..…….…….…34

Table 3.6 Data Dictionary for House Category……..…….…….…36

Table 3.7 Data Dictionary for Contact Information……..…….…36

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Table 3.8 Data Dictionary for Payment……..…….…….…36

Table 3.9 Functional Requirement of HRAS…….…..…37

Table 5.1 Version of HRAS……..……86

Table 5.2 Implementation Status of HRAS…….…..……...87

Table 6.1 Test Organization……..…….……...…93

Table 6.2 Test Schedule……..…….….…..…...…93

Table 6.3 Black-Box and White-Box Testing……..…….….…..…94

Table 6.4 Test Case for Administrator…….……...…95

Table 6.5 Test Case for Landlord…….……...…98

Table 6.6 Test Case of Tenant……..…….…...…101

Table 6.7 Test Data for Administrator…….……...…103

Table 6.8 Test Data for Landlord……..…….…...…109

Table 6.9 Test Data for Tenant……..…….…..……...…113

Table 6.10 Test Result for Administrator…….……...…117

Table 6.11 Test Result for Landlord…….…….……...…118

Table 6.12 Test Result for Tenant…….…….……...…119

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF FIGURES

PAGE

Figure 2.1 Front interface of Innago System…….……..…22

Figure 2.2 Front interface of Innago System…….…….……23

Figure 2.3 Front Interface of Buildium System……..…….....23

Figure 2.4 SDLC Methodology……..……24

Figure 2.5 GanttChart of House Rental Application System…….……29

Figure 3.1 Use Case Diagram for HRAS…….…….……38

Figure 4.1 System architecture of web-based house rental system…….……41

Figure 4.2 Login page……..……..…..42

Figure 4.3 Register page……..……..…..42

Figure 4.4 Success Alert Message……..……..…..42

Figure 4.5 Home page for Admin……..……..…..43

Figure 4.6 Manage user page for admin……..…….…....43

Figure 4.7 Add new users page…….…..…….…..…44

Figure 4.8 Update user page…….…..……..……...…44

Figure 4.9 Delete user page…….…..……..……..…...45

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 4.10 Manage house category page……..…….…..……..…45

Figure 4.11 Add house information…….……..…..…..…..…46

Figure 4.12 Update house information……..……..…….…..…..…..…46

Figure 4.13 List of house……....…….……...…..…..…47

Figure 4.14 Listing tenant……...…….…..…….…..……..47

Figure 4.15 Vacant tenant page……..……48

Figure 4.16 List of tenant's contact member…….…...…..…48

Figure 4.17 List of notifications……...……..…..…49

Figure 4.18 List of application's responses……..……..…49

Figure 4.19 Accept application response page……..…….50

Figure 4.20 Reject application response page……..…50

Figure 4.21 Responses of email with contract attachment…….…..…51

Figure 4.22 Reject email responses……..……..…..…..…51

Figure4.23 List all contract uploaded by tenant……..……..52

Figure 4.24 Landlord upload contract page…….....…...…52

Figure 4.25 List of move-in move-out responses…….…..……..53

Figure 4.26 List of complaints…….…..……..…53

Figure 4.27 Change password page…….……...…..….....54

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 4.28 User profile page……..……..…...…..…54

Figure 4.29 Add contact info page……....…..…55

Figure 4.30 View tenant's profile with contact info……..…55

Figure 4.31 View tenant contract…….……..…56

Figure 4.32 Upload contract and proof of payment page……..……..…56

Figure 4.33 List of payment rental……..…….…….……..…57

Figure 4.34 Download checklist form page…….……..……..…57

Figure 4.35 Upload checklist form page……..……..…58

Figure 4.36 Make complaint page…….……..…58

Figure 4.37 Home page of the system…….……..…..…59

Figure 4.38 List of rental houses……..……..…..……59

Figure 4.39 List of condominium……..…….…..…..…60

Figure4.40 House rental details.…….…...…….……..…..…60

Figure 4.41 Conceptual ERD for House Rental Application System…..…...…61

Figure 4.43 Admin Dashboard……..……..…….……...63

Figure 4.44 Landlord Dashboard……..……...……..…64

Figure 4.45 Delete Landlord page……..…..…….…..……..…66

Figure 4.46 Update Landlord Page……...…….…….…..…66

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 4.47 Add Landlord Page…..…….…….……..…..….67

Figure 4.48 Add Tenant Page……..…….……..…...…..….69

Figure 4.49 Update Tenant Page……..…….……...…….…..….69

Figure 4.50 Delete Tenant Page…….…….……..….70

Figure 4.51 Add House Information……..…..……..….72

Figure 4.52 Update House Information……..…….…….……..….72

Figure 4.53 Add Category House…….…….…….……..….74

Figure 4.54 Update Category House…….…….…….……...…..….75

Figure 4.55 Delete Category House…….…….…….……...…..….75

Figure 4.56 Physical design ERD of HRAS…….…….…..……...….76

Figure 6.1 Bar Chart of test result for HRAS……..…….……..…121

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF ABBREVIATIONS

FYP	**-**	**Final Year Project**
ERD	**-**	**Entity Relationship Diagram**
HRAS	**-**	**House Rental Application System**
NRIC	**-**	**National Registration Identity Card Number**
DDL	**-**	**Data Definition Language**
SDLC	**-**	**Software Development Life Cycle**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER 1: INTRODUCTION

1.1 Introduction

This project is regarding on the web application to rent houses. The purpose of the web application is to manage the process of renting a house systematically for the landlord and tenant. The web based house rental management is a system where the users must access to the web page. The system is required the users to login into the system after they had register their account. The system have 3 modules which is administrator, landlord and tenant. The system will allow administrator to manage the landlord information, tenant information and also managing the house advertising. The landlord will able to manage the rental house information, appointments, contract management and rental payment information. While for the tenant, the system will allow the tenant to search the house, view the condition of the house, booking appointment, continue the contract, and payment through online. This system will provide an easy access to the tenants to get the house depending on their preferences.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

At the some moments, there is a limited number of web based house rental management system. Majority of the landlord and tenant are using manual process. The manual process is complicated, time consuming and inconvenient. Due to the time constraints, the tenant need to pay lot of money to the house agency to help them searching the houses. By developing the system, all the information regarding on the house, facilities, landlord details can be access quickly and efficiently.

With this application, it can reduces the searching time and also can provide a convenient platform for the tenant for searching the houses and also the landlord for ease the management. Thus, this system can overcome the problem that face by both tenants and landlords without need to follow a lengthy and hectic process anymore.

1.2 Problem Statement

Every individuals want his rental house to be the strategic location with the best facilities. The manual approach to search the rent houses through agency which have to follow a length and hectic process. It takes a long time to look for the suitable house at the desired location. It is quite difficult to handle with the agency or brokers to find the house as it may ask a lot of money from the tenant if they need more information about the houses, payment and also landlord details. People need to meet the agent or broker in person, checking the house details and also need to visit the location for several times. Due to the money, energy and time constraint, the tenant does not have much time to search the desired location and house.

Aside from that, when it comes to organizing the information on each specific property, landlord face a variety of challenges. Each property may contain a considerable amount of critical that the landlord must keep track of at all times. Each area property must identified and stored by the landlord for future reference, from the address to the services provided. It may be difficult for the landlord to keep track of the properties' information because everything is saved on paper, and it takes times to locate the records when they are needed.

Property management does not manage the manual handling of properties well. The traditional approach, with no appropriate storage for the important property management. These techniques employ a lot of paper to document property information, which is not environmentally friendly. This technique also may result in the loss of crucial information about tenants and properties if it is not adequately stored in secure storage and may result in human errors.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

1.3 Objective

The objective of this project are as follows:

1. To design a systematic web application to rent house for keeping all data regarding the landlord, tenant, houses, and payment.
2. To develop a rental house management system that will ease the process of renting.
3. To test the accuracy that is consistent with the system.

1.4 Scope

The scope of the project is to manage house rental process for system administrator, landlord and tenant using web application. The features design for the application is according to the role of the users. The features are:

1.4.1 Module to Be Develop

1.4.1.1 Administrator Module

(a) Authentication - Admin must login to the system to have the privilege to manage the system according to their roles.

(b) Change Password - Admin able to update their password.

(c) Manage House - Admin able to manage the advertisement such as update, add, and delete the advertisement details.

(d) Manage Landlord - Admin able to manage landlord such as update and delete landlord's information.

(e) Manage Tenant - Admin able to manage tenant such as update and delete tenant's information.

1.4.1.2 Landlord Module

(a) Authentication - Landlord must login to the system to have the privilege to manage the system.

(b) Change password - Landlord can update their password.

(c) Manage rent house - Landlord can add, update, and delete the rent house information.

(d) Manage contract - Landlord can update the tenant's contract if they want to pursue rent the house.

(e) Manage rental payment - Landlord can update the rental information and send notification to the tenants if there have due payment to the tenants.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA