



Faculty of Computer Science and Information Technology

***DAISUKE: A GAMIFIED MOBILE APP FOR CAR
RENTAL SERVICES***

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BACHELOR OF COMPUTER SCIENCE WITH HONOURS
(NETWORK COMPUTING)

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ABSTRACT

Car rental services are becoming popular among people and in high demand these days, due to their numerous benefits, such as privacy, security, comfort, and affordability. Although there are various online car rental services platforms, some people continue to use the offline approach of renting a car rental service. Besides, the platforms used by car renters are also unreliable, such as utilising multiple social media platforms to advertise and promote their car rentals. The existing online car rental services system or application needs to be improved and include gamification elements as a strategy for the car renter's businesses. Therefore, Daisuke: A Gamified Mobile App for Car Rental Services will be developed to overcome these problems. The proposed mobile application aims to meet user preferences and simplify the car renting process. The proposed mobile application will transform a standard online car rental service application into a gamified that encourages user interaction and will benefit both users and car renters. It is also carried out to enhance user experiences that adapt with digital transformation. The proposed mobile application employed Mobile Application Development Life Cycle (MADLC) approach. Further research, requirement analysis, and design were carried out in-depth to define the requirements for developing the proposed application using this approach.

ABSTRAK

Perkhidmatan kereta sewa menjadi popular di kalangan orang ramai dan mendapat permintaan yang tinggi pada hari ini, kerana banyak faedahnya seperti privasi, keselamatan, keselesaan, dan mempunyai harga mampu milik untuk orang awam menggunakannya. Walaupun terdapat pelbagai platform perkhidmatan penyewaan kereta dalam talian, masih segelintir orang yang menggunakan pendekatan luar talian untuk menyewa kereta. Selain itu, platform yang digunakan oleh penyewa kereta tidak berkesan dalam mengiklankan dan mempromosikan servis penyewaan kereta mereka. Sistem atau aplikasi perkhidmatan penyewaan kereta dalam talian yang sedia ada perlu ditambah baik dan memasukkan elemen gamifikasi sebagai strategi untuk perniagaan penyewa kereta. Oleh itu, Daisuke: Aplikasi Mudah Alih untuk Perkhidmatan Kereta Sewa yang mengandungi elemen gamifikasi akan dicipta untuk mengatasi masalah ini. Aplikasi mudah alih seperti yang dicadangkan bertujuan untuk memenuhi pilihan pengguna dan memudahkan proses penyewaan kereta. Seterusnya, aplikasi mudah alih yang dicadangkan juga akan mengubah aplikasi perkhidmatan penyewaan kereta dalam talian yang sedia ada dengan menaik taraf perkhidmatan penyewaan kereta dalam talian yang mempunyai gamifikasi untuk mendorong interaksi pengguna yang akan memberi manfaat kepada pengguna dan penyewa kereta. Aplikasi mudah alih ini juga dilaksanakan dengan tujuan untuk meningkatkan pengalaman pengguna melibatkan teknologi digital yang maju. Aplikasi mudah alih yang dicadangkan menggunakan metodologi “Mobile Application Development Life Cycle (MADLC)”. Penyelidikan lebih lanjut, menganalisis spesifikasi, dan reka bentuk dilakukan secara teliti untuk menentukan spesifikasi yang diperlukan dalam membina aplikasi melalui kaedah ini.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Car rental is a service that aids in daily transportation. It serves people who need a temporary car for a short period of time with a variety of cars offered at reasonable prices. Renting a car is preferable to public transportation because it is cost-effective, more comfortable, safer, and saves time. Mordor Intelligence (2022) predicts that the growth of car rental services will increase in Malaysia's car rental market by 2027. This increase can be credited to the rise of online car rental services, in which the process of renting a car can be completed with only a few clicks or taps. In Malaysia, people still book and manage their rental cars manually due to their acceptance of technology as they perceive its usefulness and ease of use of an online car rental service. People who favour offline car rental services may also be influenced by poor filtering experience. Only approximately 16% of e-commerce sites offer effective product filtering (Holst, 2015). Filters are crucial in online car rental services since it aids in decision-making by filtering items based on the user's interests.

In today's e-commerce industry, gamification has become a popular trend and has been widely used in marketing activities due to its positive impacts. Gamification is about the application of game features and techniques in a non-game environment (Hajarian & Hemmati, 2020). Gamification aims to increase user engagement by incorporating game features with rewards. The point, badge, level, achievement, loyalty, and membership awards are a few examples of often utilised gamification components in the marketing industry. Not only focusing on improving users' engagement, but users' satisfaction can also be attained indirectly by implementing gamification (Hajarian & Hemmati, 2020).

Daisuke: A Gamified Mobile App for Car Rental Services will provide a convenient and easy booking option for users on the go. This mobile application aims to simplify the process of renting a car and achieve users' desired preferences. Daisuke: A Gamified Mobile App for Car Rental Services will transform traditional browsing and booking processes into a game that promotes user participation and attracts more loyal users. It is also carried out with the intention of improving user experiences that adapts with digital transformation.

1.2 Problem Statement

Today, there are alternatives for individuals to use car rental services both online and offline. However, each alternative has flaws that must be addressed. Offline car rental services are not flexible as it makes managing bookings, updating prices and available cars, and advertising promotions difficult. It can also be tedious to ask any inquiries regarding car rental services, such as the availability of dates, times, and cars. Hence, the processes of renting a car manually are time-consuming and inconvenient.

Furthermore, most car rental services market their services on social media. If car renters utilise multiple social media platforms, it will take a significant amount of time to keep them up to date with the most recent information. Additionally, car renters must make extra efforts to promote their services on various social media platforms regularly. Car renters must also remain involved and active.

Although the existing online car rental services offer better services than offline car rental services, there are still online car rental services system or application that need to be improved. One of the aspects that must be enhanced is the filtering system, which provides users with filters to reach their preferences easily and efficiently. Poor filtering results in a poor user experience. Moreover, more time is needed to manually compare options to fit user's preferences because different online platforms provide different rates and promotions. The

existing online car rental services application also lacks gamification elements to make the application more fun, interesting, and engaging to users. Therefore, the launch of Daisuke: A Gamified Mobile App for Car Rental Services will be a fun and useful solution that will benefit for its users.

1.3 Scope

Daisuke: A Gamified Mobile App for Car Rental Services is a mobile application that allows users and car renters to book and manage a car rental service respectively, from any location with an internet connection. It will offer simple bookings with detailed descriptions, filters, and price comparisons, allowing users to book according to their preferences. Daisuke: A Gamified Mobile App for Car Rental Services has gamification elements to reward users for their engagement and loyalty. Consequently, it simplifies the processes of renting a car while also developing an attractive mobile application for use, which benefits car renters by increasing user engagement. Since Kota Samarahan residents and car renters are the application's primary target users, feedback from the Kota Samarahan area will be collected. The language that will be used for Daisuke: A Gamified Mobile App for Car Rental Services is English. The limitations of this mobile application are it requires Internet access and is only available on the Android operating system due to the development cost.

1.4 Aim and Objectives

The aim of Daisuke: A Gamified Mobile App for Car Rental Services is to develop a fun and user-friendly car rental services system for users and car renters on a mobile-based application system. Based on the problem statement that has been stated, the objectives of this project are as below:

- a. To design a user-friendly interface for users and car renters in the Daisuke: A Gamified Mobile App for Car Rental Services.
- b. To develop a functional Daisuke: A Gamified Mobile App for Car Rental Services to facilitate the processes of renting a car.
- c. To assess the usability of Daisuke: A Gamified Mobile App for Car Rental Services among users and car renters.

1.5 Brief Methodology

The project will use Mobile Application Development Life Cycle (MADLC) methodology to accomplish its objectives. There are seven phases in Mobile Application Development Life Cycle (MADLC) which are Identification, Design, Development, Prototyping, Testing, Deployment and Maintenance (Vithani, et al., 2014).

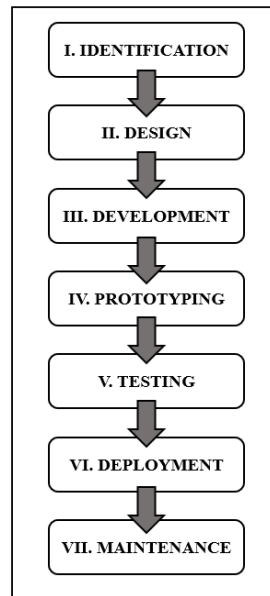


Figure 1.1: Mobile Application Development Life Cycle (MADLC) (Vithani, et al., 2014)

I. Identification Phase

New problem-solving approaches will be proposed. This phase aims to identify existing applications' problems to generate new ideas and improve them. Requirement gathering and a thorough analysis will be conducted to determine the scope of the application.

II. Design Phase

The software and tools used in developing this mobile application will be decided. Based on the selected software, the storyboard for user interface design will be created. The flow of the application will be shown in the storyboard.

III. Development Phase

The mobile application will be coded in this phase. This phase covers coding the fundamental functionalities as well as designing and coding the user interface requirements of the mobile application.

IV. Prototyping Phase

The mobile application will be tested to ensure that it meets the requirements before being distributed to users. Additional testing will be performed until it meets the requirements with no programming errors.

V. Testing Phase

The mobile application prototype will be tested on a simulator and an emulator before being tested on a real device.

VI. Deployment Phase

The mobile application will be deployed once the testing is finished, and the final feedback has been received. The mobile application will be uploaded to the relevant app store for users to use.

VII. Maintenance Phase

User feedback-driven continuous improvement. After releasing the product, the developer must constantly monitor user expectations and improve the application with new features, maintenance, security upgrades, etc.

1.6 Significance of Project

Daisuke: A Gamified Mobile App for Car Rental Services has the potential to solve the current car rental services problems by providing an enjoyable and convenient mobile application for users and car renters. Daisuke: A Gamified Mobile App for Car Rental Services also ease the process of renting a car. Users can easily choose the available car rentals according to their preferences through filters and comparison systems. Car renters can also reduce the time managing car rental services and updating their information, as well as their effort in advertising their services through this application. The gamification in the proposed application can also attract people to use the application which will benefit car renters.

1.7 Project Schedule

This project is scheduled to be completed during the Final Year Project, which has a one-year duration considering the challenges that will be faced. The project schedule can be referred in Appendix A.

1.8 Expected Outcome

The project's expected outcome is a fully functional mobile application that received good feedback from users and car renters. Daisuke: A Gamified Mobile App for Car Rental Services expected to be fun, convenient and time efficient for users to rent a car. This mobile application will facilitate the process of renting a car by giving accurate information, making it easy to book, manage, and promote rental cars. Moreover, the comparison in the application will help users to achieve their desired preferences. The filters will make it easier for users to drill down to their specific needs. The usability of Daisuke: A Gamified Mobile App for Car Rental Services is expected to ease the process and management of renting a car in an entertaining way which will improve customer relationships, brand loyalty, and increase car renters' reputation.

1.9 Thesis Outline

Chapter 1: In-depth explanations were provided for the introduction, problem statement, scope, aim and objectives, project significance, project schedule and expected outcomes.

Chapter 2: This chapter focuses on the literature reviews for four existing mobile applications that discuss its features.

Chapter 3: This chapter goes through each phase of the Mobile Application Development Life Cycle (MADLC) in depth.

Chapter 4: The development and implementation of the proposed mobile application will be detailed and described in this chapter.

Chapter 5: This chapter highlights the testing phase of the proposed mobile application as well as ensure that all requirements are achieved, and project effectiveness are assessed.

Chapter 6: This chapter discusses the conclusion of the proposed project after completing all phases. The future work that can be done to enhance the mobile application is also covered in this chapter.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The owners of car rental businesses would find it much simpler to run the business with an online car rental system. Online car rental system allows viewing the information of customers and vendors easily, anywhere, and anytime with only a few taps away. This online approach for renting cars facilitates reducing manual storage operations and replaces the conventional method of record keeping. With the existence of an online car rental system, the process of renting a car can be simplified (Ahmed et al., 2021). Moreover, car renters can also advertise their car rental services on a single platform. The increase in Malaysia's car rental market will increase the competition among them. As car rental business owners, they need to have strategies to attract their customers. Thus, gamification is one strategy to draw clients to use the services provided.

The second chapter focuses on a literature review of four existing mobile applications to examine and evaluate their features and functionality. A thorough comparison of four mobile applications is also provided. Based on the comparison, the function of the existing applications was reviewed and analysed to design the proposed mobile application.