


Research Article

Plant Assistant Application

Siti Nursaadah Mat Yusoff^{1, *}, Ong Chin Wei², Terence Mah Tick Yen³ and Hoe Kang Sun⁴

¹ Politeknik Sultan Abdul Halim Muádzam Shah; sitinursaadahmatyusoff@gmail.com  0009-0000-1490-3647

² Politeknik Sultan Abdul Halim Muádzam Shah; lmao61933@gmail.com;

³ Politeknik Sultan Abdul Halim Muádzam Shah; terence1373@gmail.com;

⁴ Politeknik Sultan Abdul Halim Muádzam Shah; sunkhoesc@gmail.com;

* Correspondence: sitinursaadahmatyusoff@gmail.com; +6011-62877487.

Abstract: *The Plant Assistant Application is a comprehensive gardening application developed to cater to the needs of inexperienced plant enthusiasts. With limited knowledge and guidance available, newcomers often struggle to provide proper care for their plants, resulting in wasted time and effort. Existing plant-based applications lack comprehensive information and detailed care guides, while physical guidebooks are expensive and hard to come by. This project aims to address these issues by creating a user-friendly application that grants easy access to plant care information, delivers guidance on optimal plant care practices, and incorporates an innovative snap feature for plant identification. The Waterfall methodology was employed throughout the project, involving phases such as requirement gathering, design, implementation, testing, and maintenance. The findings indicate that the snap feature successfully identifies plants using TensorFlow and SerpApi, providing accurate scientific names and comprehensive search results. The application boasts a minimalist and intuitive user interface, consolidating all essential plant care information in a single location. Moreover, a beginner-level guide on gardening fundamentals is included to support novices in their endeavors. The Plant Assistant Application is freely available for download on the Google Play Store. By catering to the needs of new gardeners, this application aims to cultivate a passion for gardening while offering valuable assistance in plant care, ensuring a seamless and gratifying gardening experience.*

Keywords: *machine learning, gardening application, TensorFlow, SerpApi, snap feature.*

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1. INTRODUCTION

During the Covid-19 lockdown, individuals found themselves with more free time but limited options for activities. Consequently, gardening emerged as a highly favoured choice during this period. According to a Statista survey, gardening ranked first among various activities people engaged in during their leisure time amidst the Covid-19 pandemic. However, one significant problem that arose was the scarcity of plant-related applications on mobile platforms. This is where the Plant Assistant App, as highlighted by Hirschmann (2021), became a valuable solution.

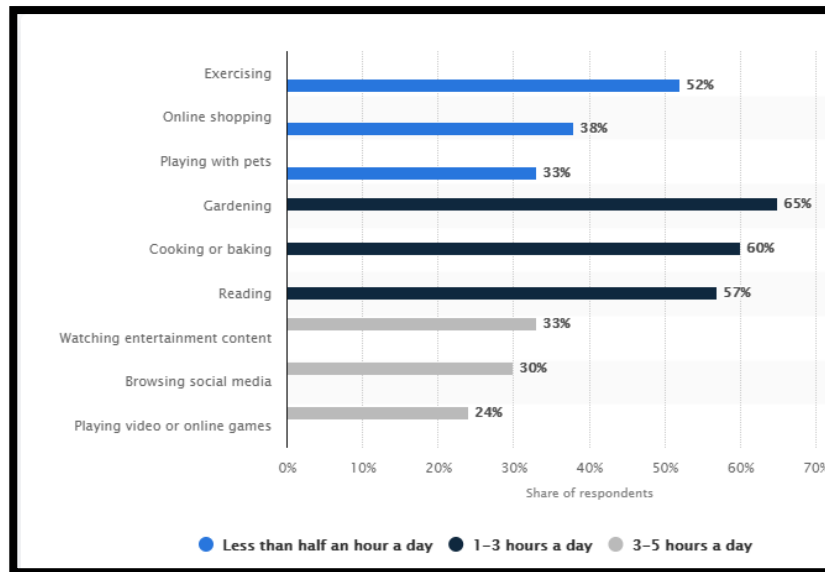


Figure 1: Malaysia: Leisure Activities MCO covid-19 (Hirschmann, 2021).

Mobile applications have emerged as popular tools for plant enthusiasts, offering convenient ways to access plant information and care instructions (Smith & Johnson, 2022; Garcia & Martinez, 2021; Brown, 2020). This project aims to develop a mobile application that caters specifically to the needs of plant lovers by incorporating a range of features to enhance their plant care experience. The mobile application will feature a snap feature for plant identification, utilizing advanced image recognition technology to allow users to capture photos of plants and retrieve detailed information about them (Smith & Johnson, 2022). This feature will be particularly useful for users who may not have extensive knowledge of plant species or struggle with plant identification.

In addition, the application will serve as a comprehensive source of plant information, providing users with easy access to care instructions and guidance on how to properly take care of plants (Brown, 2020). The application will offer a user-friendly interface that allows users to browse and search for plant information, tailored to each plant species. To ensure the accuracy and reliability of the plant data, the application will rely on reputable sources and plant databases (Garcia & Martinez, 2021).

2. METHODOLOGY/DESIGN SOLUTION

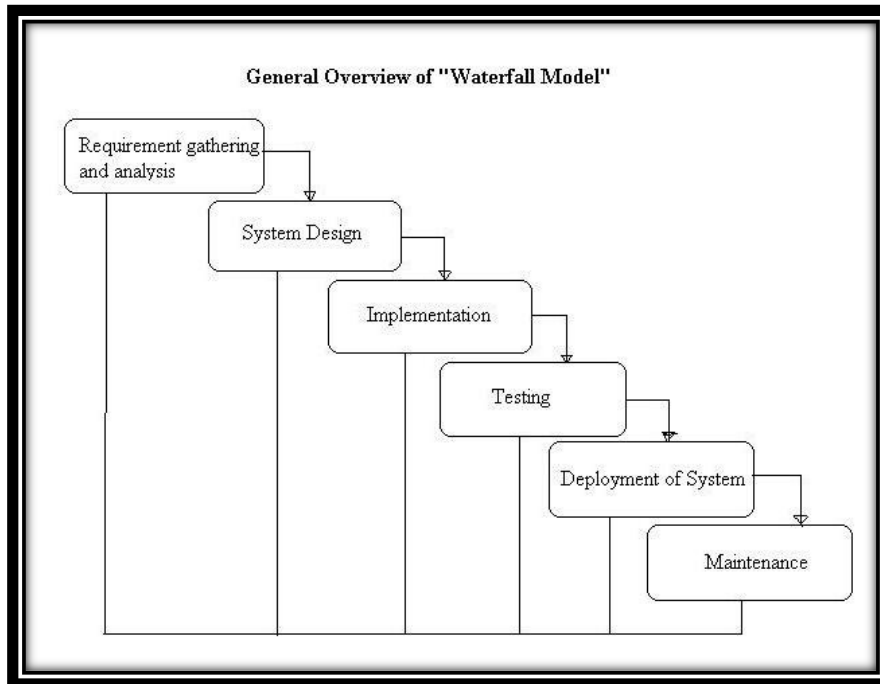


Figure 2: Waterfall Model

i. Phase Requirement Gathering and Analysis

This phase starts with an idea and a baseline for the project, it will also identify the scope, problems and plan strategies for new information system. We also construct a Gantt chart while planning in developing the system.

ii. Phase System Design

Interface design of Plant Assistant Application was developed to make it user-friendly, easier to navigate and not feed user too much information at once. The database of Plant Assistant Application is firebase as it was provided by Android Studio, the software we use to develop this system.

iii. Phase Implementation

This phase will focus on implement it into small program called units, which are integrated in the next phase. All the implements will follow the finalized design.

iv. Phase Testing

After that, tests will be held to identify any defects or errors in the application. If an error is found, the developer will fix it. Rinse and repeat until no errors will occur.

v. Phase Deployment of System and Maintenance

Once the testing is done, the product is deployed to the end user's environment. Issues that are spotted in the end user's environment will be fixed by the team. Patches will be released to eliminate any issues as well as enhance the app into a better version.

3. FINDINGS

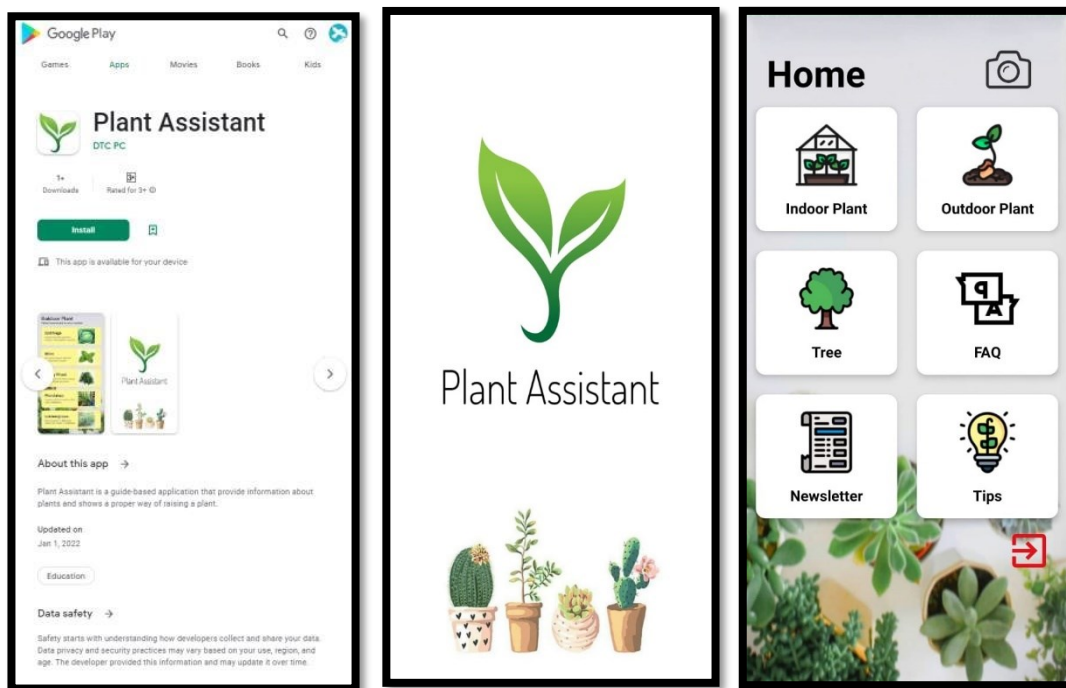


Figure 3: Application available in Google Play Store and main interface application

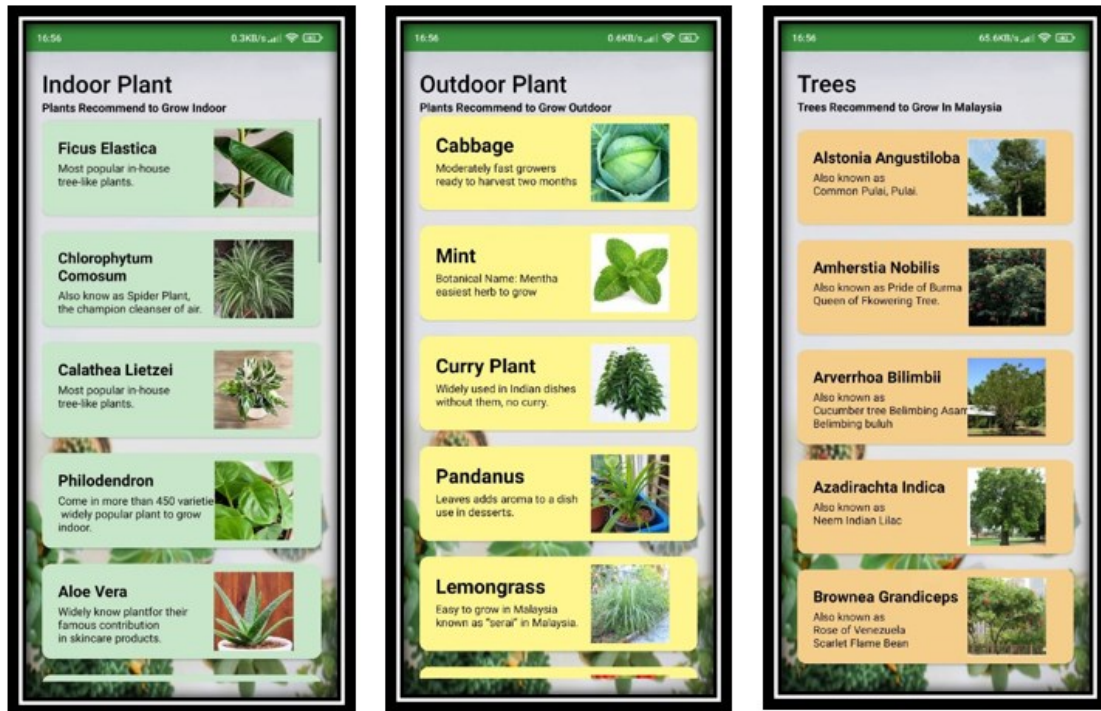


Figure 4: Interface 3 types of plant

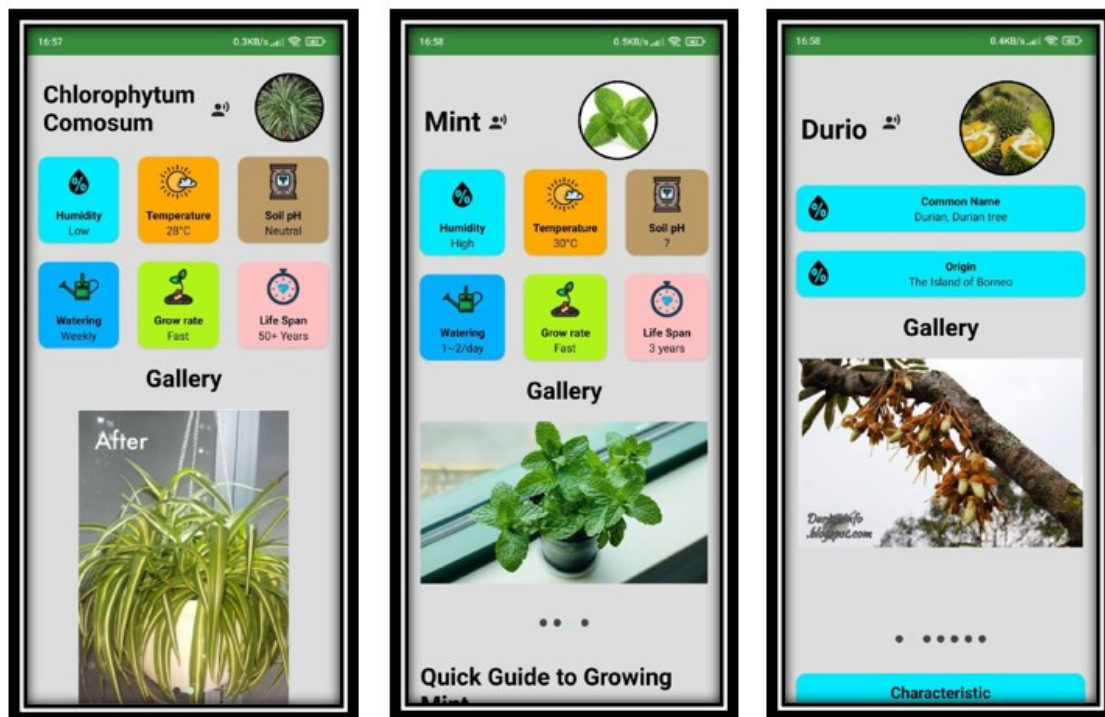


Figure 5: Interface example for 3 types of plant

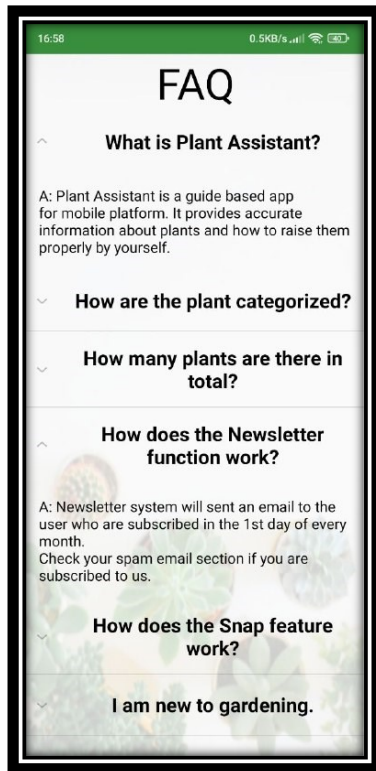


Figure 6: Interface for FAQ

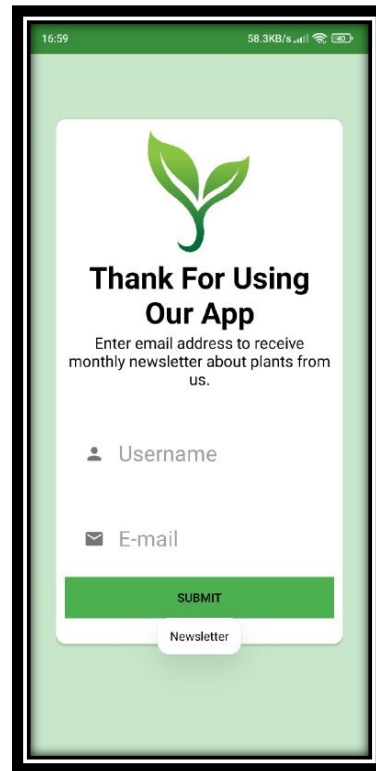


Figure 7: Interface for Newsletter

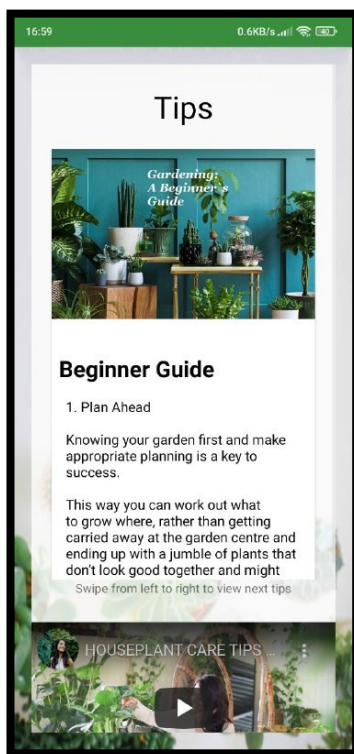


Figure 8: Interface for Tips

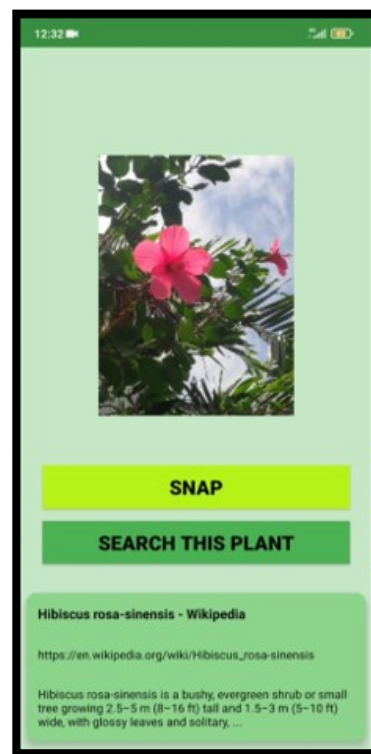


Figure 9: Interface for result Snap Feature



Figure 10: More details functions can download Plant Assistant Application in Google Play Store (<https://play.google.com/store/apps/details?id=com.finalpro.planttest&hl=en>)

4. INNOVATION HIGHLIGHT

i. Seasonal Plant Care Guidance

The Plant Assistant Application offers seasonal plant care guidance, providing specific recommendations and tips for each season. Users can access information on how to adjust watering, fertilization and other care routines based on the changing seasons, ensuring optimal plant health and growth throughout the year

ii. Plant Identification Feature

The app includes a plant identification feature using image recognition Artificial Intelligent technology. Users can capture or upload a photo of an unknown plant, and the app will provide accurate identification along with relevant care information. This feature assists users in identifying and caring for plants they encounter in their surroundings.

iii. Comprehensive Plant Information

The Plant Assistant Application offers a wide range of accurate and detailed information about plants, covering various species that can be grown in Southeast Asia. Users can access essential knowledge on plant care, including watering, sunlight requirements and pruning techniques.

iv. Categorized Plant Database

The Plant Assistant Application organizes plants into categories, such as indoor plants, outdoor plants, trees and flowers. This classification system enables users to easily find and explore the specific types of plants they are interested in, enhancing their overall browsing experience.

5. COMMERCIAL VALUES/APPLICATION

i. Gardening enthusiasts

The mobile application provides gardening enthusiasts with a valuable tool to enhance their plant care knowledge, expand their plant collection and improve their gardening skills.

ii. Beginner gardeners

For novice gardeners, the mobile application offers a valuable resource to learn about different plants, understand their care requirements and receive guidance on how to nurture and maintain a thriving garden.

iii. Homeowners with gardens

The application caters to homeowners with gardens by providing them with convenient access to plant information, care instructions and personalized reminders, helping them maintain beautiful and healthy gardens.

iv. Urban dwellers with limited space

Even with limited space, urban dwellers can benefit from the mobile application by discovering suitable plants for their small gardens or indoor spaces, accessing care instructions tailored to limited-space gardening and expanding their plant knowledge.

6. DISCUSSION

The Plant Assistant Application offers innovative features that cater to a wide range of users. Gardening enthusiasts and beginner gardeners can benefit from the app's seasonal plant care guidance, comprehensive plant information, and categorized plant database, which provide them with valuable knowledge and resources to enhance their gardening skills. Homeowners with gardens can conveniently access plant information, care instructions, and personalized reminders to maintain beautiful and healthy gardens. Even urban dwellers with limited space can utilize the app to discover suitable plants for small gardens or indoor spaces, access tailored care instructions, and expand their plant knowledge. Overall, the app offers commercial value by empowering users to become more knowledgeable and successful in their plant care endeavours.

7. CONCLUSION

In conclusion, the development of a mobile application dedicated to plant care with features such as a snap feature for plant identification, comprehensive plant information and personalized guidance has the potential to revolutionize the way gardening enthusiasts, beginner gardeners, homeowners with gardens and urban dwellers with limited space engage with plants. By providing convenient access to accurate plant information, care instructions and tailored guidance, the application empowers users to enhance their gardening skills, expand their plant collections and maintain thriving gardens.

This mobile application not only serves as a valuable tool for plant lovers but also contributes to the overall promotion of plant care and gardening practices, fostering a greener and more sustainable environment.

Achievements

- [1] Best Category 10 - Information Technology in 8th Regional Educators, and Student Product's Exhibition (RESPEX) 2023.
- [2] Gold Medal in 8th Regional Educators, and Student Product's Exhibition (RESPEX) 2023.
- [3] Gold Medal Class D: ICT & Multimedia (Plant Assistant Application) in National Innovation and Invention Competition Through Exhibition 2022 (iCOMPEX'22)

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