

Nursery.com Apps

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Abstract : Nowadays, we can observe that the interests in gardening activities are increasingly popular among various age groups. Correspondingly, buying and selling gardening items such as plants, flowers, fertilizers, etc. by using online platforms is growing rapidly. However, most of the nursery stores are still selling their products using traditional method of physical store which limit the product marketing scope. Consequently, the nursery store cannot reach more customers especially those far from the stores which can increase their sales. In addition, customers are always not aware of the existence of the nursery stores that might offer good deals for them. Thus, the Nursery.com application is a one-stop platform for all nursery owners and customers in selling and buying nursery goods. The application allows customers to have more option in choosing and purchasing nursery goods from nursery stores that register with Nursery.com. This application would also enable nursery owners to market their products more effectively. The Nursery.com application was developed by adopting the Agile Development methodology. The benefit of the application for nursery owners is that Nursery.com application can serve as a platform that makes it easier for them to reach more customers in promoting their products. On the other hand, customers can have more option to compare and choose various nursery goods from the Nursery.com application.

Keywords: nursery mobile apps, nursery products, gardening

1. Introduction

A nursery shop is a shop that sells plants, trees, flowers, and other nursery related products. Generally, most nursery shops use the traditional sales method to sell products to customers who visit the shop. In addition, the nursery owner practice calling or messaging their regular customers to inform them about the special deal. They also send emails to regular customers, informing them of the items being promoted. This traditional method of selling makes it difficult for them to obtain a large number of customers because their approach to customers is limited.

In addition, nursery shops market their products using the sales methods of social media platforms such as Facebook, Instagram, and others. However, the method of marketing through social media does not also achieve the goal of obtaining a large number of customers due to a lack of copy-writing skills to persuade customers to buy their products. Therefore, the Nursery.com application (apps) is proposed.

The Nursery.com apps gives all nursery owners the opportunity to market their products from their shop using a new platform where the platform focuses on nursery products only.

2. Related Studies

A lot of work has been done with regards to an online plant shopping site for buyers and sellers to sell and purchase plants and trees [1-5]. It provides a customer with quick convenience and joy while purchasing various products. The system also provides information on how to grow plants in such a way that customers will be instructed and encouraged to grow them properly. As a result, people may learn how to care for nature from experts. This system allows local gardeners to advertise their products to a larger audience, which was previously a challenge due to the high competition of the market. Furthermore, it may help raise awareness of environmental issues and community greening, which will act as a small effort towards saving the environment from future harm [6].

In addition, other researchers also conducted research on the useful mobile applications for nursery and field personnel [7]. This study describes several mobile applications as well as several web-based technologies that may assist with nursery production, reforestation, and conservation efforts. This study explains how mobile technology has grown tremendously in recent years. According to this research, the use of mobile applications and web-based technologies will continue to grow.

This research developed a QR-based information management system for plant shopping centers [8]. It has two major components: the server side and the mobile side. An Android mobile application was provided on the mobile side to design an electronic guiding system. The database was stored and administered on the server, as well as the necessary network. This study will maintain the information for all visits, including retrieving text and photographic information on the plants. Furthermore, it provides an electronic purchase and payment service, saving visitors' time from being wasted in queues waiting for their turn to pay. Furthermore, fake shopping carts are used in place of real ones to allow customers to move quickly around the plant mall and allow visitors to purchase plants of all sizes and weights without having to transfer them to the cashier for payment.

The researcher proposed a low-cost mobile application to detect and classify Tuta Absoluta damage on tomato plants during their early growth phase [9]. This study shows the importance of using computer vision techniques in the control of agricultural diseases and pests. In this study, a Convolutional Neural Networks (CNN) model trained on 1212 tomato leaf damage datasets was optimized for mobile development, and the performance of the model used was evaluated using a mobile application that identified Tuta mines in tomato leaf photos with minimal detection. The program delivers services in the absence of a mobile network, making it suitable for use in rural areas, which benefits smallholder farmers, especially those in developing countries.

All the previous studies either provided a web-based platform or mobile apps for nursery shop and customer buying and selling activities. However, the web-based approach cannot satisfies users in terms of anytime and anyway convenience for their shopping experience. On the other hand, the mobile apps proposed was limited to the nursery owners only where customers' buying experience was not a main focus.

3. Methodology

This study was conducted following the Agile methodology proposed by Jeff Sutherland. By using the agile method, a project can be implemented efficiently and produces high-quality software that meets the requirement. In the agile methodology, the requirements are decomposed into many small parts that can be incrementally developed. The agile method adopts iterative development. Each incremental part is developed over an iteration. Each iteration is intended to be small and easily manageable and that can be completed within a couple of weeks only. At a time one iteration is planned, developed and deployed to customers. Agile methodology is the combination of iterative and incremental process models. Steps involved in agile methodology are Requirements Phase, Design Phase, Development Phase, Testing Phase and Deployment Phase as shown in **Figure 1**.

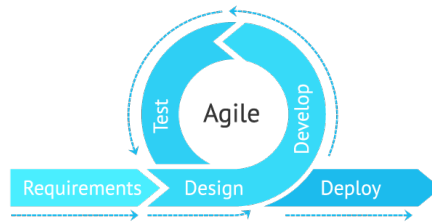


Figure 1: Phases of Agile Methodology

The requirements phase involves gathering the information and requirements for the project. Two steps are involved in the requirement gathering process. The first step is analyzing documents and information from internet resources. The relevant content is searched using keywords like “nursery plant”, “plant application” and “online plant shopping”. The information collected are analyzed and documented to construct the requirements in developing the Nursery.com application. The second step is distributing the questionnaire, which is created in Google Form. The questionnaire is created based on the information collected from the document analyzed in the first step of the gathering process to confirm with users the functional requirements of the apps. The gathered requirements were then documented and visualized using Unified Modeling Language (UML) diagrams, including the use case, sequence, and class diagrams. **Figure 2** illustrates the use case diagram where the functional requirements and users are documented.

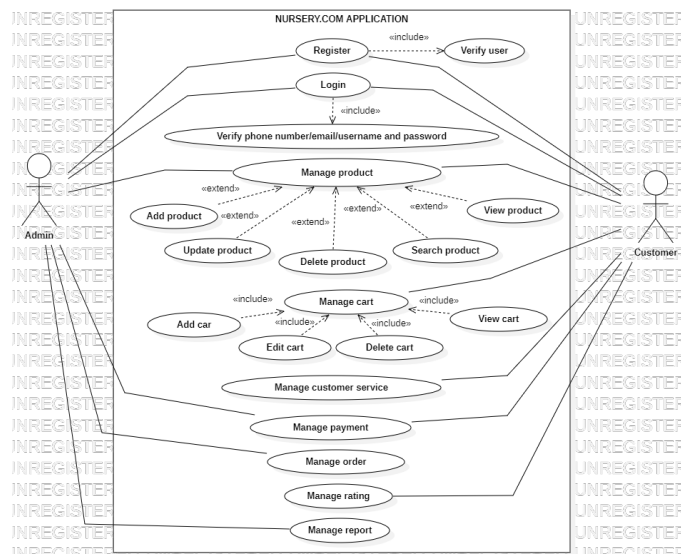


Figure 2: Use Case diagram

During the design phase, any data or requirements collected during the requirements phase are converted to design. A Mockup apps were used to design a low-fidelity prototype for the application. The application is specified and constructed using Figma software. Next, The development phase involved the development of a high-fidelity prototype and the application based on the documentation written during requirement analysis and design.

Then, the users were engaged in a testing phase to evaluate the application’s performance and provide feedback to the developer. A usability evaluation was conducted to evaluate the application’s usability and performance. The evaluation was conducted through a face to face meeting and a Google form, which were participated by 30 respondents. The instrument used is the post-task questionnaire, which is distributed to the respondents after the demonstration of the application. It aims to collect the respondents’ opinions regarding the convenience, satisfaction, and usability of the application. The questionnaire consists of three sections with a closed-ended question. Section A asked the respondents’

demographic information while Section B asked the respondents' opinion about the Nursery.com app on a five-point likert scale, where one represents strongly disagree and five represents strongly agree. Section C asked the respondents about user satisfaction using Nursery.com.

Finally, the issues or comments highlighted by the users were modified to enhance the usability of the application during the deployment phase. The continual modifications based on the users' feedback would improve the satisfaction of the users.

4. Result and Discussion

A prototype of a mobile application for selling and purchasing was developed. It represents the requirements explained in the previous subsection. Software prototyping is a common method of demonstrating the high-fidelity prototype so that respondents may provide further comments and suggestions based on their experience in interacting with the prototype. The Figma was the main development tool used. **Figures 3 to 10** show the selected interface of Nursery.com.



Figure 3: Login page for Admin and Customer **Figure 4: Main page for Admin**



Figure 5: My product page for Admin **Figure 6: My report page for Admin**



Figure 7: Location page for Customer



Figure 8: Main page for Customer

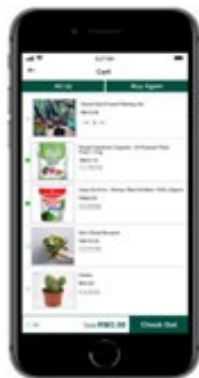


Figure 9: Cart page for Customer



Figure 10: Payment page for Customer

An analysis was conducted on the respondents' responses in Section B of the post-task questionnaire. The section measures the respondents' perception towards Nursery.com app user interaction. **Table 1** reported the frequency of the responses. Analysis of the respondent's user satisfaction information revealed that 53.3% of them think that the functions of the application are not hard to use and 46.7% of them think that some functions in the application are hard for them to use. The result shows that the most difficult part to use is the *Register* followed by the *Give Rating*. In addition, they also highlighted that the function of the password reset was difficult to use.

Table 1: The respondent's responses on the user interaction of Nursery.com

The post-task questionnaire items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Do you think the Nursery.com application overall looks good?	0 (0.00)	1 (3.33)	5 (16.67)	8 (26.67)	16 (53.33)
Do you think the application is user-friendly?	0 (0.00)	0 (0.00)	4 (13.3)	11 (36.67)	15 (50.00)
Does Nursery.com save you time when you see it?	0 (0.00)	0 (0.00)	4 (13.33)	10 (33.33)	16 (53.33)
Do you think the Nursery.com is useful overall?	0 (0.00)	2 (2.67)	3 (10.00)	11 (36.67)	14 (46.67)
Do you think the Nursery.com meets your needs?	1 (3.33)	1 (3.33)	7 (23.33)	10 (33.33)	11 (36.67)
Is the Nursery.com app easy to learn how to use?	0 (0.00)	0 (0.00)	3 (10.00)	10 (33.3)	17 (56.67)

5. Conclusion and Future works

This paper described the design and development of a mobile app for all nursery owners, giving them the opportunity to market their products from their shop using a new platform where the platform

focuses on nursery products only. Moreover, it enables customers to conveniently purchased nursery products in their region. For future work, it is hoped that this application can be used more widely than just in the area of Kedah. However, there are also some improvements that would makes the apps more user practical such as the provision of the google map direction of the nursery's stores. In addition, the customers' feedback on their shopping experience would help nursery owners to improve their services.

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