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Design and Development of Mobile Application: Nursery.com Application

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Abstract : The ever-increasing use of the internet in Malaysia presents a rising opportunity for e- marketers. In the field of Horticulture, an electronic commerce website or application consist of buying and selling products. The e-commerce website is very helpful for customers and gardeners even though selling plants and gardening products online is not as widespread as selling books or new high-tech gadgets. However, problems are still existed where most of the gardeners or nursery owner still experiencing difficulties in selling their product and reaching more customers. Besides, customers are also facing difficulties in comparing the price of the plants and gardening products from various nurseries. The Nursery.com applications intend to assist local gardeners in selling their plants online and to offer customers a more practical and trustworthy means to search, compare, and purchase the desired plants that are suited for their needs. Customers can also access product descriptions and details online and search the various of nursery shop. Additionally, a door-step delivery was also offered for customer. An agile methodology was adopted to develop this application. The methodology was chosen because it allows for modifications in requirements at any time. While working on the development, the developer can listen to end-user feedback to meet the end requirements of users. Finally, the foresee advantage of the application is that it can help nursery owners to market their product in a wider area coverage. In addition, customers can have more options and good deals from the various nursery stores at a single platform.

Keywords: nursery mobile apps, nursery products, gardening

1. Introduction

The harmony of nature and the life of humans depend on plants. It is an essential element of the biological diversity of the planet and a crucial resource. For such basic needs, people rely on plants. Due to factors like urbanization, rising affluence, and an increasing global population, these needs are escalating quickly. Besides, the demand for the plants in Malaysia also increased because many Malaysians found a new hobby and interest towards house plants and gardening. However, despite the growth and expansion of the nursery business, some aspects have an impact on the financial performance and revenue of nursery owners. Some nurseries in Malaysia encountered problems that

have caused the nursery shop to shut down because they were not well received by the locals. The traditional methods that have been used by the nursery owner to promote their nursery do not reach the target customer. For example, shop owners give the brochure and business cards in the nearby areas only. This is a method that is implemented by most nursery shops.

Lastly, the nursery shop area is not strategic. The area is also far from the rural area, making it hard for the customer to go there. Next, customers find it difficult to know the operating hours of the nursery. Sometimes customers come from far away, and suddenly the nursery shop is closed. When customers call the nursery shop, the line is busy and does not pick up the call.

2. Related Studies

To successfully develop a mobile application (apps) that can be used by the nursery users, research on the existing problems that opens to the high demand of the nursery apps has been made. In [1],the authors have pointed out that in horticulture businesses, there is a lack of data on purchases and information searches related to gardening. The behavior and perception of customer toward online gardening purchases and search activities is one of the factors that contribute to the deficiency. In addition, other studies highlighted that there were differences in gardening-related searches by age and marital status, but not by region of residence, income, or gender. In this survey, they asked the respondent about how a representative group of Americans seek information online for a wide variety of information and who is making purchases online related to gardening and for what variety of products. The result shows that 27.3 % looking for gardening information. This study provides horticulture businesses with a point of comparison by include searches of non-gardening types of information. This study also shows that most purchases for gardening are still made in person rather than online. However, as the retail gardening market matures and Internet usage rises, companies that sell gardening-related goods should start to acknowledge the Internet as a significant information and, in some cases, a product distribution channel [1, 2].

In [3], authors has discussed on an electronic commerce website which consists of buying and selling goods that are meant to help users and gardeners alike. They also discussed about the problems that gardeners face when selling their products. It also introduce customer and gardener an online marketplace where people can purchase and sell plants, trees, services, and information, as well as to allow people escape their busy lives and delight in nature. Furthermore, another study [4] has discussed the advantages of e-commerce technology in Ornamental Plant business. In this study they find out the effectiveness of using e-commerce in ornamental plant business, and what benefits that can be made for ornamental plant farmers. Thus, the study concluded that e-commerce has unquestionably risen to prominence in our society. The ease with which customers can purchase goods and learn about their descriptions without having to speak with a live person is made possible by e-commerce. The claim made, combined with the fact that the quality of sales services and sales transactions are improving and making it simpler for customers to transfer money, is what drives the use of e-commerce in the ornamental plant business [5-7]. Due to the advancement of information technology and electronic commerce, businesses now have new chances to make up for shortcomings like a lack of access to new markets and expand their worldwide R&D efforts [8]. Unfortunately, there is still gardeners or sellers out there who are not exposed about the e-commerce. The authors discussed about prioritizing factors influencing the adoption and use of garden products e-commerce from gardeners' viewpoint. The study indicate that gardeners have a trust issues with the e-commerce platform also the lack of information about the e-commerce cause the gardeners reluctant to us e-commerce for gardening product purchase [9]. Thus, this study intents to provide users of nursery, nursery owner and customers, a platform where they could perform buying and selling transaction in more secure and friendly manner using a nursery.com mobile apps.

3. Methodology

The apps development adopted the Agile methodology. The methodology has five (5) phases which are requirement analysis, design requirements, development, testing/quality assurance, and deployment. The flow of the phases of the Agile methodology was illustrated in **Figure 1**.
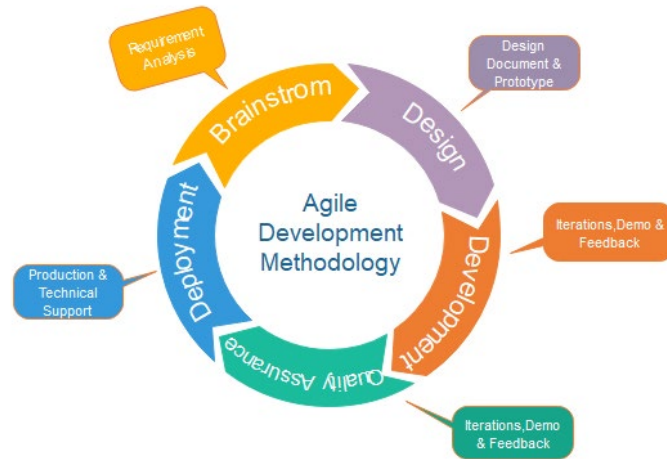

Figure 1: Phases of Agile Methodology

In the requirement analysis phase, the information was gathered and the requirements were documented. This phase includes activities of brainstorming and understanding problems that were faced by target users of the apps who are nursery owner and their customers. The main problem identified was the traditional methods that have been used by the nursery owner to promote their nursery do not reach the target customers. Meanwhile, customers were facing the limited number of nursery shop nearby to shop for the nursery products, especially during covid pandemic [10]. In addition, research on the current system and similar applications was conducted to identify the strengths and weaknesses of the current application for nursery domain. The documents were searched using Google searching engine by providing keywords primarily "nursery plants product," "nursery shop owner," "nursery online shop," "plant nursery management," The documents were analyzed to elicit the requirements for a mobile app that can provide selling and buying of the nursery products.

In the next phase of design, the gathered requirements were documented using Unified Modeling Language (UML) such as use case diagram, use case specification and sequence diagram. For the database design which was carried out in parallel, the design was documented using the entity relationship diagram (ERD) and relational model was constructed. All the documentation becomes the guideline for the apps development. Then, the prototype was constructed based on the system documentation suign Figma software. Initially, the prototype just only showed the main functions and interfaces based on the users' requirements.

Next, in the development phase, the prototype was presented to users and feedbacks are gathered from them. The prototype demos were done iteratively with the enhancement activities by developer. The feedbacks and comments from users were used to correct or enhance the prototype. Finally, the enhanced prototype becomes a final application that can be deployed to users.

Before the application can be deployed to users, it need to go through testing or quality assurance phase where the application was tested to confirm its functions and usefulness. The test was done to ensure all its functions could be used. In this phase, a usability evaluation was conducted on 30 respondents which consist of the community in north district area in Malaysia. The Nursery.com application and a post-task questionnaire were the tools used for the evaluation. The post-task questionnaire, that have been developed has 16 questions in 3 sections. In Section A, demographic

questions about the respondents were asked, in Section B, a five-point Likert scale with one (1) representing strongly disagree and five (5) representing strongly agree was used to evaluated the respondents' opinions about user interface evaluation. In Section C, a five-point Likert scale with one representing strongly disagree and five representing strongly agree was used to evaluate the respondents' opinions about user satisfaction. The respondents followed the evaluation's step-by-step instructions, which were to read, use the Nursery.com app in accordance with the experiment's instructions, and then respond to a post-task questionnaire.

Finally, during the deployment phase, the application would be made freely available to users through play store for community use. The developer would continually provide technical support to users. It is hoped that user experiences would contribute to further feedbacks and comments for continuous improvement of the apps.

4. Result and Discussion

A prototype of a mobile apps for selling and buying named as Nursery.com was developed. It represents the requirements gathered as conducted in the requirement analysis and design in the previous methodology section. Software prototyping is a common practice for displaying product requirements so that users can provide additional feedback and suggestions based on their interactions with the prototype [11]. The Figma was the main development tool used. Screenshot in **Figures 2 - 5** show the selected interface of Nursery.com app.
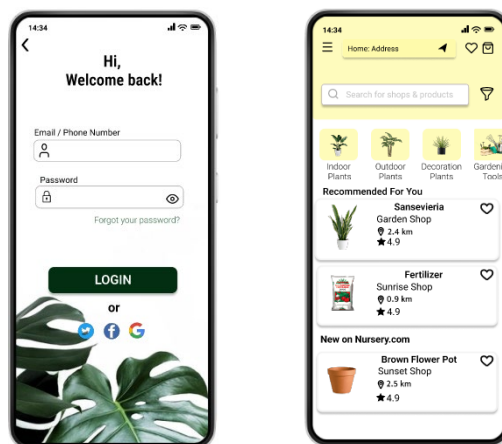

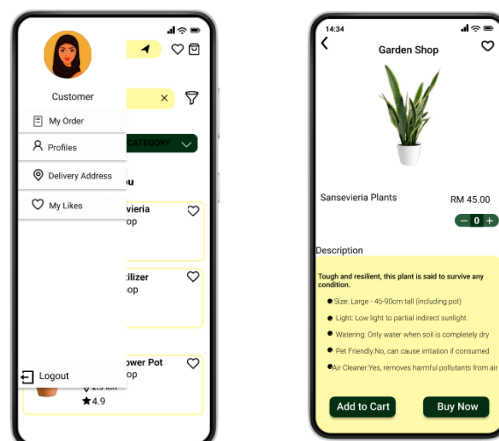**Figure 2: The interface for login customer and nursery owner and main page for customer buying**

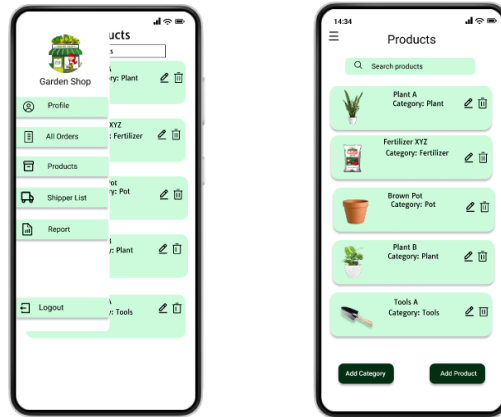**Figure 3: The interface of main menu for customer and view product**

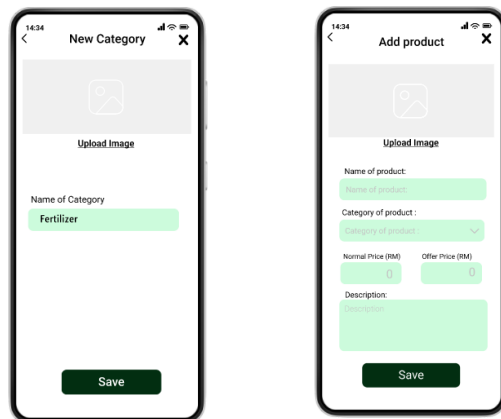**Figure 4:** The interface of main menu and main page for nursery owner

Figure 5: The interface of add category and add product for nursery owner

Before the apps was released for use, the usability testing has been conducted as explained in testing or quality assurance phase in previous methodology section. The testing evaluates on the apps user interface and users' s satisfaction. The responses for Section B and C were analyzed as tabulated in **Tables 1 and 2**. Section B evaluates respondents' opinions on the user interface and simplicity of the Nursery.com Application. The percentage of the responses were provided in **Table 1**. The three usability factors received ratings from the respondents on four or five of the post-task scales. No respondents gave a rating of one or two. Few people gave neutral ratings.

Table 1: The respondent's responses on the user interface evaluation

The post-task questionnaire	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
User has good control of interface	0(0.00)	0(0.00)	3(10.00)	15(50.0)	12(40.0)
The font used is easy to read	0(0.00)	0(0.00)	1(3.33)	4(13.33)	11(36.67)
The color used are appropriate	0(0.00)	0(0.00)	8(26.67)	15(50.00)	7(23.33)
When action is performed , appropriate and logical feedback is given	0(0.00)	0(0.00)	4(13.33)	13(43.3)	13(43.3)
Buttons are reasonably easy to click on	0(0.00)	0(0.00)	3(10.00)	14(46.67)	13(43.33)
The functions that I expect to find in the menu items are present.	0(0.00)	0(0.00)	3(10.00)	18(60.00)	9(30.00)

On the other hand, section C evaluates respondents' opinions on the user satisfaction towards Nursery.com Application. The percentage of the responses were provided in **Table 2**. The three usability factors received ratings from the respondents on four or five of the post-task scales. No respondents gave a rating of one or two. Few people gave neutral ratings.

Table 2: The respondent's responses on the user satisfaction

The post-task questionnaire	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I feel comfortable using this application	0(0.00)	0(0.00)	3(10.00)	20(66.67)	7(23.33)
It is easy to learn this application	0(0.00)	0(0.00)	3(10.00)	16(53.33)	11(36.67)
It easy to find the information I needed	0(0.00)	0(0.00)	5(16.67)	16(53.33)	9(30.00)
The nursery shop of information on the application screen is clear	0(0.00)	0(0.00)	5(16.67)	16(53.33)	9(30.00)
I felt very confident to use this application	0(0.00)	0(0.00)	3(10.00)	19(63.33)	8(26.67)
Overall, I am satisfied with how easy it is use this application	0(0.00)	0(0.00)	3(10.00)	18(60.00)	9(30.00)

The findings of the evaluation in terms of the user interface revealed that the respondents reported that nursery.com application buttons are reasonably and easily clicked, and when action is performed, appropriate and logical feedback is given. Furthermore, the respondents were satisfied with the Nursery.com application and planned to recommend the application to other people.

5. Conclusion and Future works

Nursery.com application is fully functional and has proven itself in the hands of testers and evaluators. According to the results of this study, the platform also received positive comments from all of the participants during the testing because it is a time-saving, accessible, recent, and simple to use application. The results show that the platform is a trustworthy application for gardeners who wish to sell their products online and for customers looking to acquire plants.

In the future, the nursery.com application should expand the area that are not limited in the northern district only. The enhancement in terms of providing real photos of the plants to customer is seen to benefit in terms of the friendliness of the apps in enhancing customers' buying experience.

Acknowledgement

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