ANDROID MOBILE APPLICATION SYSTEM FOR PET CARE SERVICES USING MVVM ARCHITECTURE

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ABSTRACT

The K1 clinic (Kawan Kewan) is a veterinary clinic in the city of Magelang that was established in 2018. There are many ways to improve the services at the K1 clinic (Kawan Kewan). Pet Owners are worried when going to the vet clinic because they are uninformed of the incurred expenses that they will get after having a medical examination at the clinic. Meanwhile the clinic needs a system that can manage administration and can increase the satisfaction of customers who come to the clinic, as well as manage all administration related to the veterinary service process. The primary goal of this research is to make an Android-based mobile application to simplify administration and give a better experience for every customer who come to the veterinary clinic. In this research, the waterfall method is used as a testing tool because this method allows for departmentalization and control. Therefore, this method is suitable for solving the existing cases at the K1 Veterinary Clinic (Kawan Kewan) by utilizing the MVVM architecture framework for Android application development. The application, which was created utilizing the MVVM design and the Kotlin programming language, was tested on users and produced pleasing results. It efficiently meets the needs of users and clinics, making pet services possible.

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INTRODUCTION

Pet welfare is a fundamental right that belongs to the pets themselves (Appleby et al., 2018; Bekoff & Meaney, 2013; Stucki, 2020). However, it often lacks attention from many people, especially pet owners. This is evident in their lack of knowledge about their pets and the absence of facilities supporting pet welfare (D’Cruze et al., 2019; Hampton et al., 2020; Sherwen & Hemsworth, 2019). One crucial aspect to consider is the quality of their diet and regular health check-ups to protect them from viruses and diseases (Boseret et al., 2013; Varela et al., 2022). Therefore, it is important for pet owners to be aware of the veterinary clinics operating in their residential area for consultations within a specified timeframe.

A veterinary clinic serves as a facility where pet owners can take their sick pets for check-ups, receive routine care, and provide daycare services (Blackwell & O’Reilly, 2023; Owczarczak-Garstecka et al., 2022). One of the main problem for pet owners is they are worried about the costs (Applebaum et al., 2020; 2023; Packer et al., 2019). This uncertainty is one of the reasons they do not go to the vet clinic to check on their pet. Veterinary clinics play a significant role in managing overall health services for pets (Fortney, 2012; Iqbal et al., 2021; Niemec et al., 2020). Furthermore, these clinics handle daily consultations for animals seeking treatment, aiming to enhance the quality and health of the animals being treated.

With the rapid development of technology and information, mobile-based information has gained more appeal due to its modern and user-friendly nature (Dahri et al., 2023; Zeyad et al., 2023).
The researchers conducted a case study research on the use of this technology at a veterinary clinic in Magelang, namely the K1 clinic (Kawan Kewan). The Kawan Kewan Veterinary Clinic currently offers a website service for registration and appointments with veterinarians, but the website's functionality is still not optimal in meeting the service demands.

Presently, the service system at the K1 clinic (Kawan Kewan) requires pet owners to fill out a registration form, leading to significant waiting times even after making an appointment through the website. This results in long queues at the K1 clinic (Kawan Kewan) due to the form-filling process. Therefore, the K1 clinic is actively seeking solutions to enhance service quality, which includes introducing mobile applications for clinic appointments, home visits by doctors, pet hotels, and grooming services. This application is expected to encourage pet owners to bring their pets to the veterinary clinic, in order to maintain the health of their pets and also create a healthier environment to avoid diseases and viruses. Also, the benefit of this application is to increase customer satisfaction and attract new customers with exclusive offers available only through the application.

The MVVM (Model-View-View-Model) pattern is employed to effectively separate the business logic and application presentation from the user interface (UI). By maintaining a clear distinction between the application logic and UI, the MVVM pattern addresses various development challenges and enhances the testability, maintainability, and development process of applications. Moreover, MVVM facilitates code reuse, enabling developers and UI designers to collaborate seamlessly in the development of their respective components within an application.

Based on the research findings on Pawp, Rover, and PetDesk, it is evident that these three applications were developed specifically for the Android platform. These applications serve as platforms for providing pet care services that are available round the clock, offering various services such as emergency care, virtual consultations with veterinarians, and in-person pet care services. Additionally, all three applications also provide additional services including pet sitting, pet walking, and pet grooming services.

What distinguishes this research is that this study emphasized that pet owners can choose the service they want themselves, from examinations at the clinic to vet checks at home and find out the price in advance. Therefore, the aim of the current research is to make an Android-based mobile application to simplify administration and give a better experience for every customer who come to the veterinary clinic. The research may improve the management of veterinary clinics by providing an efficient way to manage clients, employees, consultation (animal care), services and products

METHOD
The design of this application follows the implementation method using the Waterfall development model, which is a sequential technical model in software development.

1) Activity Diagram: The activity diagram in Figure 1 illustrates the flow of activities associated with the system.
2) Use Case Diagram: The use case diagram in Figure 2 showcases the roles of users and their interactions with the system.

3) Class Diagrams: The class diagrams in Figure 3 provide a clear depiction of the structure, class descriptions, attributes, methods, and relationships of each object in the system.
System Analysis

The initial step in application design involves analyzing user requirements and identifying the necessary features. In the case of pet care services, this analysis should include features related to vaccination schedules, veterinary medical history management, and more. Once the user needs are identified, the application architecture needs to be designed.

The MVVM architecture is well-suited for developing mobile applications on the Android platform. In the architectural design phase, the main components of the application, such as network services, user interface (UI), and data processing, are determined. The code development is then carried out using the Kotlin programming language and the MVVM Architecture framework. The code should be optimized for the Android platform.

The next step is testing, which ensures the application functions properly on the platform. Once the testing phase is completed, the application is ready for implementation and launch. It is important to publish the application on the Google Play Store, making it available for users to download and utilize.

Lastly, maintaining the application is crucial to ensure its proper functioning and continuous improvement based on user needs. Maintenance tasks include bug fixes, addition of new features, and enhancements to app performance.

Needs Analysis

The needs analysis focuses on the requirements of the new system that will be implemented at the Kawan Kewan Magelang Clinic. The following aspects have been identified:

1) Efficient implementation process: The adoption of the new system should be carried out in a timely manner, minimizing any disruptions to the clinic’s operations.
2) Accurate information generation: The new system should be capable of generating relevant and accurate information, ensuring the availability of reliable data for decision-making and analysis.
3) System security: It is essential to maintain system security by implementing password protection, safeguarding data from unauthorized access.
4) Proper data storage and organization: The new system should provide efficient data storage and organization capabilities, ensuring that information is easily retrievable and well-organized.
5) Comprehensive transaction support: The new system should encompass a wide range of transaction types, capable of replacing the functionalities of the old system and supporting various clinic operations.

RESULT AND DISCUSSION
System Specifications
A mobile application for pet care services has been developed using the MVVM Architecture, running on the Android platform. The following are the technical specifications of the system used in application development:
1) Programming Languages: Kotlin, Python,
2) Web Technologies: HTML, CSS, JS
3) Frameworks: MVVM Architecture, Django
4) Databases: PostgreSQL, Room Database
5) Servers: DigitalOcean
6) Third Party Services: Firebase Authentication

Application Usage Procedures
The following steps outline the procedure for users to utilize the application:
1) Download the app from the Google Play Store and install it on your mobile device.
2) Open the app and create a new account by providing your phone number. An OTP (One-Time Password) code will be sent to your number via SMS.
3) Once logged in successfully, you can add your pet's profile by entering its name, date of birth, breed, and type.
4) Select the "Home" option. From there, you can choose the type of service you require, which includes Vet Service, Grooming, and Pet Hotel. (Figure 4)
5) Proceed to specify the desired options from the available service menu. (Figure 5)
6) Select the "Pets" option and choose the date and time of your pet's arrival. Confirm the booking. (Figure 6)
7) Upon successful booking, you will receive further notifications and updates from the clinic.

By following these procedures, users can efficiently utilize the application to access and manage various pet care services, ensuring convenience and streamlined service delivery.
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Figure 4. Home App

Figure 5. Vet Services

Figure 6. Details Booking

Figure 7. Confirm Booking for Home Vet Service
CONCLUSION

Based on the conducted research in developing the "Kawankewan" application software, the researchers draw the following conclusions. The development of the "Kawankewan" application involved four main steps: needs analysis, system design, implementation, and testing. The application is designed for the Android platform and offers services such as booking appointments both for home and clinic service at desired times and providing information on the price range for pet inspection fees. The application, developed using the Kotlin programming language and the MVVM architecture, was tested on users and yielded satisfactory results. It effectively fulfills the needs of both clinics and users, facilitating pet services.

The researchers provide the following suggestions for the development of similar research in the future:

1) Expand to other platforms or operating systems: Consider developing the application for other platforms or operating systems to cater to a broader range of users.
2) Conduct comprehensive quality analysis: Perform in-depth quality analysis to ensure that all aspects of the application are functioning optimally and to further enhance its overall quality.
3) Explore additional features: Explore the possibility of incorporating more comprehensive features into the application, addressing various needs and requirements of both pet owners and veterinary clinics.

REFERENCE


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