A Development of a Prototype based Mobile Pet Care Application

Gan Ai Leen

Institute of Computer Science and Digital Innovation, UCSI University, 56000 Kuala Lumpur, Malaysia

Shabana Anjum Shaik

Institute of Computer Science and Digital Innovation, UCSI University, 56000 Kuala Lumpur, Malaysia

Chloe Thong Chee Ling

Institute of Computer Science and Digital Innovation, UCSI University, 56000 Kuala Lumpur, Malaysia

Abstract

The keeping of domesticated pets has become a norm in today's society, and taking care of them has become a part of the humane culture. With the rapid advancement of technology in the current era, more people are beginning to utilize it in their everyday life. This project aims to create prototype based mobile pet care application that is able to make the users life easier. The pet care application is based on the android application. Its objective is to provide the users a way to book the necessary appointment through the use of mobile phone without having to do it manually. Additionally, the application will include a chat function which can connect with the users and the admin. The application will enable the pet owners to get timely updates about their pets when they are away and under pet care. It will also provide options for grooming and healthcare facilities for the pet. This project aims at developing an initial prototype of the pet care android application.

Keywords: Mobile Application, Prototype, Pet, Pet Care Application, Android Application

1. Introduction

The 21st century is truly a marvelous era with the introduction of new technologies, especially wireless communication, these technologies have shaped the very way we live and has brought forth many conveniences and benefits to many different sectors of society, economy, countries and many more. The Internet too can be seen as a large-scale information distribution which centers around the many users. In today's world, people of all ages will definitely have at least a mobile phone in hand, and it has played a part in their everyday life. It has become an important factor to the people as they are unable to be separated from it. This change has brought forth an impact for the people in their daily habits due to the advancement in technology. Just like mobile phones, the pet care industry is also playing a part in the everyday life for people who own pets. The pet industry is ever so expanding at a fast rate, this is because the demand in pet population and pet related services is evolving at a very rapid rate and is also emerging in the global market. Pets are a part of our everyday life, since the start of the old century until now, a majority of households will surely own a pet or two. This is because there are benefits to keeping pets in household, studies have shown that owning a pet can increase productivity and lessen stress due to the bond between the people and their pets. What is pet? In Oxford dictionary terms, it is referred to as domesticated animals which are kept in home for the sole purpose of companionship, either for a family or a respective person.[1] Psychologists has proven that people owning pets have a positive impact on their happiness. For example, people who are lonely or just want a companion are told to keep a dog or a cat to quell their loneliness. The general public have viewed the very idea that pets are not only for companionship, but they can also serve as substitutes for psychologist or physicians, as the idea of living with pets have shown to improve mental health, and longevity.[2] In comes the pet care system. Why do we need a pet care system? The pet care application system helps in dealing with problems which involves pet services. It also brings

together both the pet owners and the people who provide these services together. The use of the pet care systems allows pet owners to have the ability to choose what kind of services they need, while keeping things like the pricing, proximity, or experience of the pet care service into consideration.[3]. Google is one of the top searching website engines used in the whole world with an estimate of 5.6 billion searches each day. 30% of the people will use Google to book appointments at various places such as restaurants, clinic, movies, etc. According to statistics, 88% of people will research product information before they make their purchase via online.[4]

Pet ownership is increasing every year, and along with it the demand of quality vet service and pet grooming is also increasing. This in turn has encourage the growth of the sector called the Internet of things (IoT) technology. With using IoT, pet owners are able to monitor pets' health, book for services for their pet, or even remotely interact with their pets.[5] IoT has made it possible for any monitoring of pets easy with just a click any mobile application through internet connection.[6]

Technology has advanced till this date and will surely improve in the future. There are multiple pet care developments that offer a variety of pet care apps especially on mobile phones. The apps include various features for the users' daily needs, such as walking and playing meter, health checkups, and video chats. These apps are made to help manage a pet owners time and worries as it can help them to monitor their pet's health and fitness.

The reason why mobile application is preferred than websites is because the users are able to access the app faster due to it being on the mobile phone, whereas for websites, the users need to turn on their laptop/computer. Mobile application also has a lower maintenance cost and developing time compared to websites. The use of the mobile application helps to motivate pet owners to use them to help keep their pets in tip top shape anytime.

2. Literature Review

For one person, to understand the meaning of companionship with animals and its lives plays an important role in the way professional pet care services are organized and well-delivered.[1] Research have shown that pet owner take precautionary step to unsure

their pets get well deserved treatment, and as such, they expect veterinarians to do the same.[2] As we know, there are an abundance of websites dedicated for our pets and to get to know their symptoms and treatment, but the information provided and quality of these sites differ greatly among each other. Experts have expressed their concern on whether the consumers are able to discern which is authentic and which is not.[3] Studies have shown that some sites found online gave unreliable or inaccurate source of information regarding the pet symptoms, thus leading to some online consumers having second thought about online pet care systems.[4] According to Yifan Ge, the pet industry is an ever-growing industry which seeks to develop in this line of market should not only be good at discovering and understand what customers need, but also try to understand from the aspect of product quality, sales channel, price and promotion. If one wants to succeed in the pet line industry, product quality would be the utmost importance. Not only that, but they must also grasp the importance of improving it too.[5] It has been pointed out of the advantages of the new era of communication infrastructure, where the Internet has provided a form of threshold to communicate with nearly everyone worldwide. Whereas in the real world, it is limited to the distance and time.[6] The pet care service is one of those web-of-object (WOA) architecture service which provides a real-time and adaptive service control based on the environment change. It adopts a service overlay network concept for providing new services.[7]

The is where the application of the Internet of Things (IoT) comes in. IoT is vast, and yet, also versatile to use in almost everything. The capability it possesses is the connection of various gadgets in one network, especially of the use of the mobile phone, via the Internet, through sensors, are making remarkable formula to achieve the goal of smart recognition, position tracking, monitoring, and many more. [8],[9],[10] With the use of these technology, difficult task such as the caring of animals can be automated through the help of IoT.[11] The pet care application is a type of mobile app which specializes in pet related service. Its sole purpose is to bring together pet owners and the people who work in the service together. The app gives the owners the ability to choose which services they need and the time they want into consideration. [12],[13]

During the Covid-19 pandemic, it was a difficult situation for pet owners and the staff to come face-to-face to address the health issue of the pet. In the year 2019, a digital health survey which was conducted by

Accenture suggested that nearly half of the people aged between 22 to 38 years old only used routine healthcare services. They desire a medical service which is far more convenient and easier to access than the usual healthcare which was used by the previous generation. For example, they hope to have easy access to medical services through the means of online or through the use of mobile applications (apps).[14] This can also be applied to pet related healthcare.

It is preferable under the development of the pet care application to include a chat function. The application is based on real time and the objective of the chat function is to create an online platform which can connect the pet owners and the staff for them to chat in regards to checking the status of their pet or so on.[15]

Table 1: Comparison Table

Mobile Applications	JomPaw	Rover	Meowtel	Prototype mobile application (Pets App)
Pet Boarding/Pet Hotel	✓	✓	✗	✓
Pet Salon	✗	✗	✗	✓
Pet Taxi	✓	✗	✗	✓
Vet Service	✗	✗	✗	✓
Pet Tips	✗	✗	✗	✓
Chat & message function	✓	✓	✓	✓

2.1. *Similarities between these mobile applications*

Based on the comparison table above which is Table 1, the similarities that all these app have are the chat & message function. In order to have a conversation between the pet owner and the staff, this function is a definite must in all pet care system.

2.2. *Differences between these mobile applications*

Most of the applications above do not provide the services such as veterinarian care, and also pet tips. The pet tips should be included in all pet care system in the case where an emergency happen, the pet owners will know what to do before seeking professional help. As for the vet services, this service is also important in all pet care as the pet owners do not have to find other places to treat their pets.

2.3. *Pets App Mobile Application*

The proposed prototype mobile application shown in the comparison table above which is Table 1 will feature services and added feature which the system does not have. Pet Paradise mobile application differs from most pet applications is that to be able to use it, the user will have to be a member. It is free to sign up and they would be able to use most of the features on the app.

3. Problem statement

3.1. *Problem 1: Limited options for existing pet care system*

The flaws for the existing mobile application include less options for pet owners to choose. Pet owners would like have an app which has many services for them to choose. Enhancement for the proposed mobile application will include more options to showcase an all-in-one app.

3.2. *Problem 2: Complex User Interface (UI)*

Mobile application may be one of the best options for quick services, but some of the existing mobile application's UI design is complex, and thus lead to the users' dissatisfaction. Mobile applications UI design has to be made simple and easy to understand for people of all ages, especially towards old people as their learning process is slow due to old age. And the input controls for the UI have to be easy to search since users are usually pressed for time.

3.3. *Problem 3: No chat function*

Most pet application do not come with a chat function. Having the difficulty of being at the place physically, pet owners would most definitely prefer to have a messaging function that can connect them to the staff.

This is to ensure that they can chat or be kept updated on their pets if they were to worry about them.

4. Methodology

The objective is to study the existing pet care mobile applications that is available on the app store, by doing this, it can help to identify both the strength and weakness of the current pet care system. Once the objective is found, the prototype pet care mobile application will be designed and developed which will include extensive options to all pet owners. Once the development of the prototype system is done, evaluation on the performance of the proposed prototype mobile application will be done by conducting testing to get the users perception.

The major research problem that developers aim to solve is by collecting data from users to identify potential users who are more likely to use which features in the system, and to seek comments and suggestions, which can be crucial for the development of the system. Questionnaire was chosen because it allows faster collection of data from larger data sets. Hence, this can be used to help developers study the user's needs and wants. The survey questionnaire form will be sent to random UCSI students from various background in order to collect an objective data for the prototype application development.
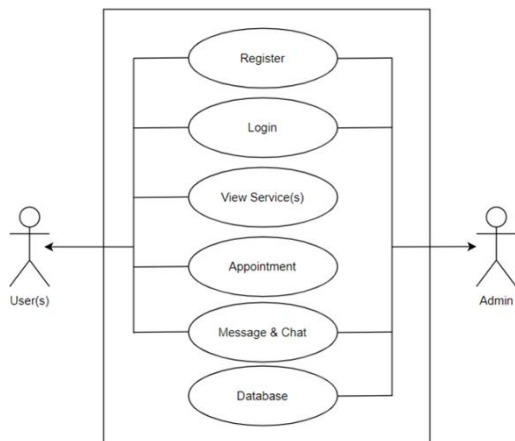

Figure 1: Use Case Diagram

The use case diagram shown in Figure 1 shows two actors, the users and the admin. The users are able to access the mobile application to register as a member. Once the registration is successful, they will be able to log into the application, which they will then process to view the services provide on the mobile app. The users

are also able to book an appointment and chat with the staff, which are the admin. The same goes for the admin, they are able to registers and login into the system but only on the admin side. The admin can also chat with the users, the only difference is that admin has database access to view all information that is kept in regards to the mobile app.
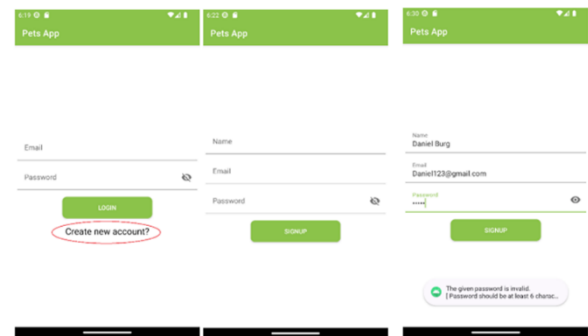

Figure 2: Registration of pet owners to use the pet care mobile application

In Figure 2, it shows where the users can click on the create a new account, once the user has clicked on it, it will lead them to a new page for them to input their name, email, and their preferred password. Once they have filled up the necessary form, the user can click on the signup button and they will be a registered member of the mobile app. It also shows what will happen when a new user includes a password of less than 6 characters. A notification will pop up at the bottom of the screen indicating that it is an invalid password.
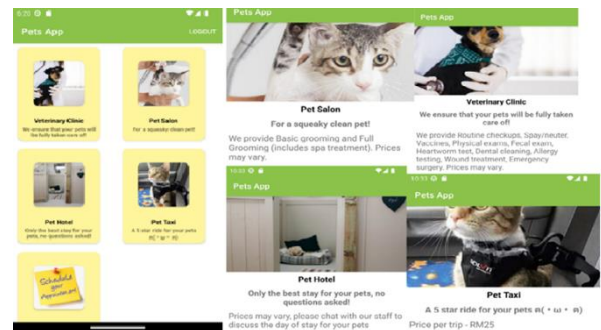

Figure 3: Homepage and pet services option after a successful registration

Once the users have successfully logged in, it will lead them to the homepage which is shown in Figure 3, and shows the users the various services that are available for them.
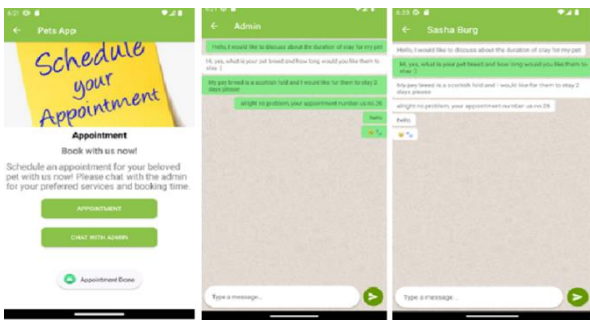
Figure 4: The active chat application to converse with the admin

In Figure 4, it shows the button which is used to chat with admin in regards to discussing which and what services, and also the booking time that the user wishes to book. It also shows the perspective of the chat function for both the user and the admin, on the left is where the user chats with the admin while the right is vice versa.
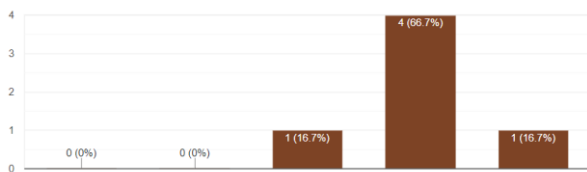
5. Result

Figure 5: Graph of the prototype testing survey

Based on the Figure 5, it shows the responses from the prototype testing survey, out of all 6 users, most of the participants have a good experience when using the prototype system. While the majority of the respondents have shown positivity on the prototype app, we can conclude that because it is a prototype app, improvements can still be made to it to ensure it can become a full-fledged, working app before it can be released for public use.

6. Conclusion

The development of modern technology is rapidly changing with each passing day, Nowadays, mobile phones are no longer restricted to just making phone calls or sending messages. In the 5G era that we are now living in, smart phones have now been integrated into everyone's life, no matter the age group.

Mobile phones have brought forth many conveniences throughout our life. It has allowed us to communicate at an efficient rate, which includes online chat and video call, streaming videos, or the commonly used mobile applications that has made the life of people easier. It is believed that in the near future, website usage will be phased out slowly, as mobile technology is growing stronger as the years go by.

As of now, the current prototype system will definitely need to undergo changes in the future to be a full-fledged, usable mobile application. Appointment will need to undergo changes and add a form with calendar or clock feature for ease of booking. Improvement to the user interface will also be a part of the future development.

References

1. Pet. (2006). In Oxford Word power Dictionary (3rd ed). Oxford: Oxford University Press
2. Herzog, H. (2011). The impact of pets on human health and psychological well-being: fact, fiction, or hypothesis? Current directions in psychological science, 20(4), 236-239.
3. Mahamuni, S. R. (2021). Pet Care Web Application (Doctoral dissertation, CALIFORNIA STATE UNIVERSITY, NORTHRIDGE).
4. https://www.pymnts.com/news/retail/2018/omichannel-ecommerce-consumer-habits/.
5. Chen, Y., & Elshakankiri, M. (2020). Implementation of an IoT based pet care system. In 2020 Fifth International Conference on Fog and Mobile Edge Computing (FMEC) (pp. 256-262). IEEE.
6. Aguirre, E., Lopez-Iturri, P., Azpilicueta, L., Astrain, J.J., Villadangos, J., Santesteban, D. and Falcone, F. (2016). Implementation and analysis of a wireless sensor networkbased pet location monitoring system for domestic scenarios. Sensors, 16(9), p.1384.
7. Christine Morley & Jan Fook Prof (2005). The importance of pet loss and some implications for services, Mortality, 10:2, 127-143,
8. Jason B. Coe, DVM; Cindy L. Adams, MSW, PhD; Brenda N. Bonnett, DVM, (2007). PhD, Journal of the American Veterinary Medical Association, Vol. 231, No. 10, Pages 1510-1518
9. Eysenbach G, Kohler C. (2002). How do consumers search for and appraise health information on the world wide web? Qualitative study using focus groups, usability tests, and in-depth interviews. BMJ.
10. Murray E, Lo B, Pollack L, et al. (2003). The impact of health information on the internet on the physician-patient relationship: patient perceptions. Arch Intern Med.
11. Ge, Y., Thongrawd, C., & Duangthongsuk, W. (2022). ORBITZ HOUSE" PET CARE ON-LINE STORE.
12. Schroeder, Carolin. (2015). Through space and time: Mobile apps in Urban Development.
13. Lee, N., Lee, H., & Lee, H. (2016). Things-aware smart pet-caring system with internet of things on web of object architecture. In 2016 International Conference on Information and Communication Technology Convergence (ICTC) (pp. 1247-1252). IEEE.

14. Patel, K.K. and Patel, S.M. (2016). Internet of things-IOT: definition, characteristics, architecture, enabling technologies, application & future challenges. International Journal of Engineering Science and Computing, 6(5).

15. Liyanage, W. L. S. V., & Wedasinghe, N. (2021). Implementation of Smart Pet Care Applications in an IoT Based Environment.

16. Cheng, Y. H. (2019). A development architecture for the intelligent animal care and management system based on the internet of things and artificial intelligence. In 2019 International Conference on Artificial Intelligence in Information and Communication (ICAIIC) (pp. 078-081). IEEE.

17. Mahamuni, S. R. (2021). Pet Care Web Application (Doctoral dissertation, CALIFORNIA STATE UNIVERSITY, NORTHRIDGE).

18. Vanshri, S., Veena, P., Priyanka, D., & Priyanka, G. (2018). Pet Care System based on android Application. International Journal for Research in Applied Science and Engineering Technology, 6(3), 1915-1919.

19. Belton, P. (2019). Would you be happy to see your doctor online? BBC News.

20. Mohammed, M. A., Bright, A. S., Apostolic, C., Ashigbe, F. D., & Somuah, C. (2017). Mobile-Based Medical Health Application-Medi-Chat App. Int. J. Sci. Technol. Res, 6(5), 70-76.

Authors Introduction

Ms. Gan Ai Leen
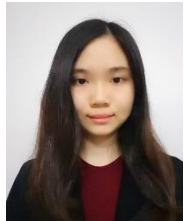
She is currently student at Institute of Computer Science and Digital Innovation (ICSDI) UCSI University, Kuala Lumpur, Malaysia. Her research interest includes Mobile and web Application development.

Dr. Shaik Shabana Anjum

She received a B.Eng. degree in Computer Science and engineering and M.Eng. degree (Hons.) in Software Engineering from Anna University, Chennai, India, in 2010 and 2012, respectively, and a Ph.D. degree in Computer Science from the University of Malaya, Malaysia, in 2018. She is currently a Lecturer at UCSI University, Malaysia. Her research interests include the IoT, wireless sensor networks, radio frequency identification, ad hoc networks, cognitive radio, and energy harvesting. She has been accoladed with many awards at international competitions and appreciation at the faculty level for her research projects.

Dr. Chloe Thong Chee Ling

She received her PhD in Information Systems, from Universiti Putra Malaysia in 2015. She is currently an Associate Professor in UCSI University, Malaysia. Her research interest include Applied Coputing, Information Management and Digital Inoovation.