Pound It: A Web-based System For The Anti-Rabies Program Of The Naga City Veterinary Office

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Senior project submitted to the faculty of the

Department of Computer Science

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in partial fulfillment of the requirements for their respective

Bachelor of Science degrees

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Chair, Department of Computer Science	Dean, College of Computer Studies
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Declaration of Original Work

We declare that the Senior Project entitled

PoundtIt : A Web-based system for the Anti Rabies Program of the Naga City Veterinary Office

which we submitted to the faculty of the

Department of Computer Science, Ateneo de Naga University

is our own work. To the best of our knowledge, it does not contain materials published or written by another person, except where due citation and acknowledgement is made in our senior project documentation. The contributions of other people whom we worked with to complete this senior project are explicitly cited and acknowledged in our senior project documentation.

We also declare that the intellectual content of this senior project is the product of our own work. We conceptualized, designed, encoded, and debugged the source code of the core programs in our senior project. The source code of third party APIs and library functions used in my program are explicitly cited and acknowledged in our senior project documentation. Also duly acknowledged are the assistance of others in minor details of editing and reproduction of the documentation.

In our honor, we declare that we did not pass off as our own the work done by another person. We are the only persons who encoded the source code of our software. We understand that we may get a failing mark if the source code of our program is in fact the work of another person.

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Department of Computer Science

EXECUTIVE SUMMARY

Rabies is a deadly viral disease rampant in Asia but advances in medicine have made it possible to have rabies-free countries. Currently, there are no statistics of stray dogs and cats but it is known that their population is growing [3]. Dogs being the number one carrier of rabies, will be focused on by the study. A web-based system will be made to increase the scope and capabilities of the current Anti-Rabies Program of the Naga City Veterinary Office. The following software development tools will be used, PHP and MySQL will be utilized in the backend development while the proponents will utilize the Bootstrap Framework for the user interface(UI) of the application. The current setup in the Naga City Veterinary office is being done manually when it comes to appointment scheduling for vaccination, records management and other transactions in the office all work on a pen, paper, and record books. With these current problems, the proficiency of outputs are affected. With the problems that are presented that exist in the manual setup of the office, the proponents will create a web application system that will replace the manual method of records management and will provide a more efficient and effective way in doing these transactions.

TABLE OF CONTENTS

Chapter 1

Introduction

1.1 Project Context

With the growing population of pets in the country, some pet owners see their pets as an inconvenience so they tend to abandon it on the streets. Some pets search for food on the streets because their owners are not capable of giving them food everyday. With this, there are dangers for these ex-housepets getting killed or getting run-over. These stray pets may be fed but are not neutered and this will cause rapid population growth of stray pets. As the population of stray pets increases, the number of rabies cases will also increase [3]. The Philippines is ranked 6th in having the most number of dogs worldwide with 11.6 million as of April 2017 [7]. The country is also one of the top 10 countries with a rabies problem which causes hundreds of deaths each year [1]. When people take their pets to a pound they are basically letting go of their pets and sentencing them to their death [3].

The reality here in our country is that there are too many stray dogs which can lead to inevitably killing them because they also can harm people when they get in their way and when people hardly go to the pound to adopt these pets [25]. Overpopulation of stray pets which are mainly cats and dogs is not good for the country because we also deal with the homelessness of people but there are solutions provided to lessen the population of these stray pets. The Sterilization of these animals allows us to control the population. Neutering and spaying, dog catching are part of the solutions in decreasing the population of stray cats and dogs [8].

The Anti-Rabies Program of the City Veterinary Office of Naga City is comprised of four modules. The first module is the Mass Vaccination. Employees of the Naga City Veterinary Office go from one barangay to another on a schedule or as requested by a barangay official or a resident to vaccinate the dogs and cats in the area. The second module is the Stray Pet Catching. They randomly go to a barangay to catch stray dogs and cats at least four times per week. Barangay officials also request them to do rounds at their respective barangays if they see the need to do so. Owners are given three (3) to five (5) days to claim their dogs from the pound before they are euthanized through lethal injection. The third module is the Population Control Castration. This is where pets that are brought in the office can be castrated so that they can be less aggressive and also control their population. The fourth module is the Information Education

Campaign. This consists of programs that the City Veterinary Office held in barangays to raise awareness about rabies and spread knowledge on how to avoid dog bites as well.

1.2 Significance of the Study

The significance of this research is to help the Naga City Veterinary Office record the vaccinated dogs, captured dogs, and adopted dogs. It will also be used to raise awareness in our society on what is happening to pets that have been abandoned by their owners and what to do with them. This study will also seek to educate the people about rabies and reduce the number of rabies cases in Naga City. This will also aim to reduce the number of stray dogs and cats in Naga City together with dog-bite related cases. This web application aims to help both the users and the Naga City Veterinary Office in reducing the cases of rabies in the city and help pet owners in retrieving their pets. With this research this web application recording all the files will be easier through a database and will also help the Naga City Veterinary office to adapt with the advancements of technology.

1.3 Objectives

1.3.1 General Objective

The main objective of this study is to develop a web-based application for the Naga City Veterinary Office with regards to their Anti-Rabies Program while also having an adoption system and a forum incorporated into it.

1.3.2 Specific Objectives

- To create a module that lets users request an appointment for vaccination/castration at the Naga City Veterinary Office.
- To create a module where users can send reports for stray dog/cat catching and dog bite incidents in different areas of Naga City.
- To create profiles for the users of the system.
- To create profiles for pets that are caught in the Stray Pet Catching module.
- To create a module where users can adopt pets that are captured before they are euthanized.
- To create a forum where users can interact with each other through posting threads and replying to them.

- To generate reports on the number of captured, vaccinated, castrated, euthanized and adopted pets.
- To display the dates of upcoming Educational Campaign Events.

1.4 Scope and Limitations

The system will be limited to the four modules of the Naga City Veterinary Office Anti-Rabies Program, which are: (1) Mass Vaccination; (2) Stray dog catching; (3) Population Control Castration; and the (4) Information Education Campaign. An option to adopt the pets caught in the Stray Pet Catching module will be added. The system will also serve as a platform where users can interact with one another through the use of a forum.

The users of the system will be limited to the employees of the Naga City Veterinary Office and people living in Naga City because of certain modules that are not applicable to those outside the City. Since it is a web-based system, a web browser and an Internet connection will be required to access it.

Chapter 2

Review of Related Literature and Systems

This chapter consists of a list of related literature and systems that will help in creating the web-based system PoundIt. Studies were grouped together and discussed how it would affect the development of the system.

2.1 Stray dogs and Rabies

Rabies is an infectious viral disease transmitted through a bite or scratch from an infected animal. Considered as a fatal disease but it is 100% preventable [8,9]. 99% of rabies cases are caused by domestic dogs and 95% of rabies related cases are from Asia and Africa [8]. Traditional rabies control measures in dogs have included mass vaccination, movement restrictions and control of stray dogs. The measures have been effectively applied in most of the developed world since the 1940s, resulting in relatively effective control and in some cases elimination of dog and human rabies [17].

In the past years, there are at least 200 deaths caused by rabies in the Philippines. There are reported 257 deaths in 2010 and 202 deaths in 2011 [1]. For the past 5 years, rabies cases still remain around the 200 mark as can be seen on the table below [12].

REGION	YEAR					TOTAL
	2014	2015	2016	2017	2018	
3	29	29	39	50	38	185
04A	49	31	37	32	23	172
12	27	21	19	34	9	110
5	16	25	22	18	3	84
1	21	24	19	10	8	82
11	21	16	15	10	10	72

NCR	21	22	10	10	7	70
7	3	10	15	21	14	63
6	10	15	11	19	7	62
10	12	16	16	11	5	60
9	15	8	11	10	4	48
2	19	10	7	5	5	46
CARAGA	10	11	11	7	1	40
8	7	5	10	12	5	39
04B	4	0	4	5	2	15
ARMM	1	2	6	3	2	14
CAR	1	0	7	5	1	14
Philippines	266	245	259	262	144	1176

Table 2.1 Reported Human Rabies Case by Region, Philippines, 2014-2018

It has been estimated that 55,000 deaths annually with over 31,000 in Asia alone which are mostly children. Most of these deaths caused by rabies can be prevented through prophylaxis (PEP) which involves immediate wound washing, rabies immunoglobulin which are medication that are made up of antibodies that fights against the rabies virus and vaccination [17]. These statistics further expand the proponents research in showing how rabies affects the people in our country.

2.2 Information management system for rabies prevention and disposition outpatient department

The system is an information management system is for the working efficiency of the rabies prevention and disposition outpatient department can be improved. The correctness and the Integrity of the data recorded are also improved and the deficiencies of individuals in a prevention and disposition can be brought down and checking up in a doctor also improved [16]. The system focuses on prevention on rabies, which the proponents will also be focusing on.

2.3 Using Web-based Technology

It has been found out that the use of a web-based scheduling system increased the number of appointments and reduced the client's wait time. It is also noted that health institutions must offer highly responsive and systematic procedures [11]. From this, it can be derived that creating

a web-based system such as PoundIt will increase the number of clients that the City Veterinary Office will get.

2.4 Animal Data Management System and Methods of Managing Animal Data

This study focuses on storing data and sorting for management of information for animals. This system provides a database for animal health facilities, veterinarians and also for pet owners The system also provides access to the pets medical history for all the pet owners and also for the veterinarians including features that implements faster communications with pet owners [10].

2.5 Companion Animal Adoption Study

This article recommends chances to improve owners perspective of their pets and help with the adoption process for their pets by (a) Providing more knowledge through the owners about their pets behaviors and health, (b) Guiding potential people who will adopt pets on how to place the pets appropriately, and (c) instructing adopters to promote the wellbeing and maintenance of their companions [14].

2.6 The role of vaccination in rabies prevention

Rabies vaccines are an integral part in the methodology to diminish dog rabies, the reason of 98% of all worldwide human rabies deaths. Nonetheless, eliminating rabies would not be possible without the cooperation of both health and animal experts. There is a pressing need to set up assessment systems in regions where surveillance is not present [15].

2.7 Related Systems

2.7.1 PAWS (The Philippine Animal Welfare Society)

The Philippine Animal Welfare Society is a registered non-profit organization which is dedicated to the protection and the promotion of humane treatment of all animals. It has animal rehabilitation center at quezon city. The organization rehabilitates these animals in the hope of finding them a new life and a home to stay in. They also have programs and events which

informs the people on what to do with pets that are unwanted. They also have the option to adopt these pets [3].

2.8.2 PHILAHIS

The Philippine Animal Health Information System (Phil-AHIS) is a system designed to enhance the animal health and management of the country through the use of automatic data generation . It features an integrated reporting system accessed by the local government and the regional offices involved. With three components: (1) Surveillance and Vaccine System, (2) Laboratory Information System, (3) Livestock Movement Monitoring System, the system's objectives are focused on reducing personnel required to manage data, maintaining data and database integrity, and to integrate Phil-AHIS to other existing information systems in the Philippines [2].

Chapter 3

Technical Background

The chapter discusses the specific items and functionality of it that will be used on the system proposed by the proponents.

3.1 Architectural Framework

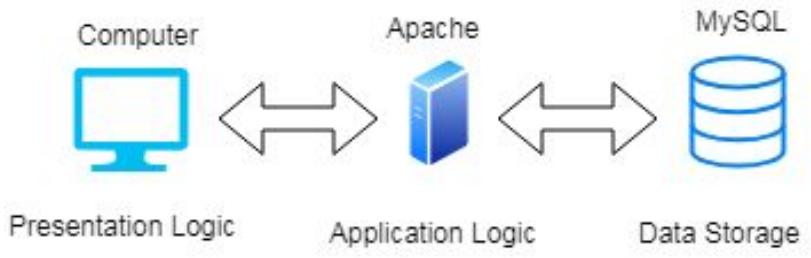


Figure 3.1 Three-Tier Architecture

The architectural design that the proponents will be using is Three-tier architecture. The proponents chose this framework because of its scalability, performance and availability that enables faster development phase.

Each tier can scale horizontally. The user can load-balance the presentation tier among three servers to satisfy more Web requests without adding servers to the Application and Data tiers. If the application tier is down and caching is sufficient, the Presentation tier can process Web requests using the cache.

3.2 Software Development Tools

Listed below are the software and the software development tools that the proponents will use to develop the system.

3.2.1 Code Igniter

Code Igniter is a open-source software use in building dynamic websites in PHP. The proponents chose this because of the familiarity of the framework and already introduced in Web Development subject.

3.2.2 Visual Studio Code

Visual Studio Code is an IDE developed by Microsoft for Windows, Linux, and MacOS**.** The proponents will be using this to write codes for creating the system.

3.2.3 PHP: Hypertext Preprocessor

PHP: Hypertext Preprocessor is a general-purpose programming language originally designed for web development. The proponents will use this in designing and developing the front end part of the web application.

3.2.4 Cascading Style Sheet 3

Cascading Style Sheets is a style sheet language used for describing the presentation of a document written in a markup language like HTML. CSS3 the latest of the Cascading Style Sheets language that has a lot of new features and layouts [18]. This will be used to make the web application more responsive.

3.2.5 JavaScript

JavaScript, is a high-level, interpreted programming language that conforms to the ECMAScript specification. It is the most well-known language used for web pages [19].

3.2.6 XAMPP

XAMPP is a free and open-source Apache distribution which contains MariaDB, Perl and PHP. It is easy to install and easy to use [20].

3.2.7 Apache

Apache is the most widely used web server software. Developed and maintained by Apache Software Foundation, Apache is an open source software available for free. It runs on 67% of all web servers in the world. It is fast, reliable, and secure [21].

3.2.8 MySQL

MySQL is a database system used on the web that runs on the server. It is very fast, reliable, and easy to use. It uses standard SQL and compiles on a number of platforms [22].

3.2.9 HTML 5

HTML 5 is a software solution stack that defines the properties and behaviors of web page content by implementing a markup based pattern to it. It is the fifth and current major version of the HTML standard, and subsumes XHTML [23].

3.2.10 Bootstrap

Bootstrap is a free and open-source CSS framework directed at responsive and used for web development. It contains HTML, CSS and JavaScript-based design templates for forms, buttons, navigation and other interface components [24].

3.3 Hardware Development Tools

The following specifications listed below are the hardware to be used by the proponents in developing the application.

- Sony VAIO e series SVE15117FGP
    - Windows 7 Pro
    - Intel(R) Core(TM) i5-2450M CPU @ 2.50GHz
    - AMD Radeon HD 7500M/7600M series
    - 4GB RAM

- Lenovo Thinkpad T420
    - Windows 7
    - Intel(R) Core(TM) i5 2410M CPU @ 2.3Ghz \
    - Intel HD Graphics 3000
    - 4GB RAM

- Macbook Air (2015)
    - MacOS High Sierra
    - 1.6 Ghz Intel Core i5
    - Intel HD Graphics 6000 1536 MB
    - 4GB RAM

Chapter 4

Methodology

This chapter represents the necessary tools, methods and strategies will be used in developing the project.

4.1 Requirement Analysis

4.1.1 Waterfall Process Model

Waterfall process model will be used throughout the development period of the project. This model involves finishing each phase completely before commencing the next one. When each phase is completed successfully, it is reviewed to see if the project is on track and whether it is feasible to continue.

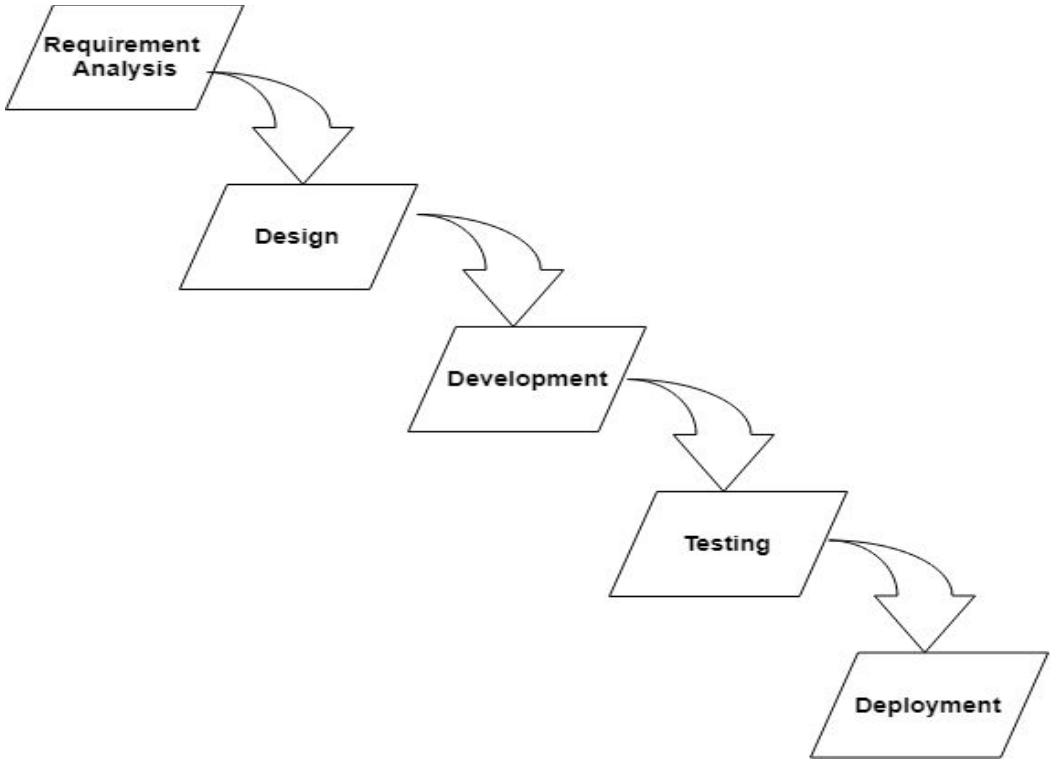


Figure 4.1 Waterfall Process Model

In **Requirement Analysis Phase**, the proponents are expected to communicate with their clients regarding the development of the project. An interview will be conducted to the Naga City Veterinary Office regarding the information and processes about the Anti-Rabies Program.

Next, the **Design phase** included the creation of the software architecture. In this phase, the proponents started to make diagrams such as system design, context diagrams, entity-relationship diagrams. The design features and functions of the system were also described in details including the user interface which can be seen in the screen layouts.

The third phase was the **Development.** All the tools mentioned in Chapter 3 will be used. The proponents will start coding each module of the web application.

Next to development, is **Testing.** After the development of the system, proponents will need to look for actual users that will test the application, look for errors and ask for their feedback. Debugging of code is included.

Last is the **Deployment**. In this phase, the proponents will deploy the actual system to the Naga City Veterinary Office.

4.2 Design

4.2.1 Entity Relationship Diagram

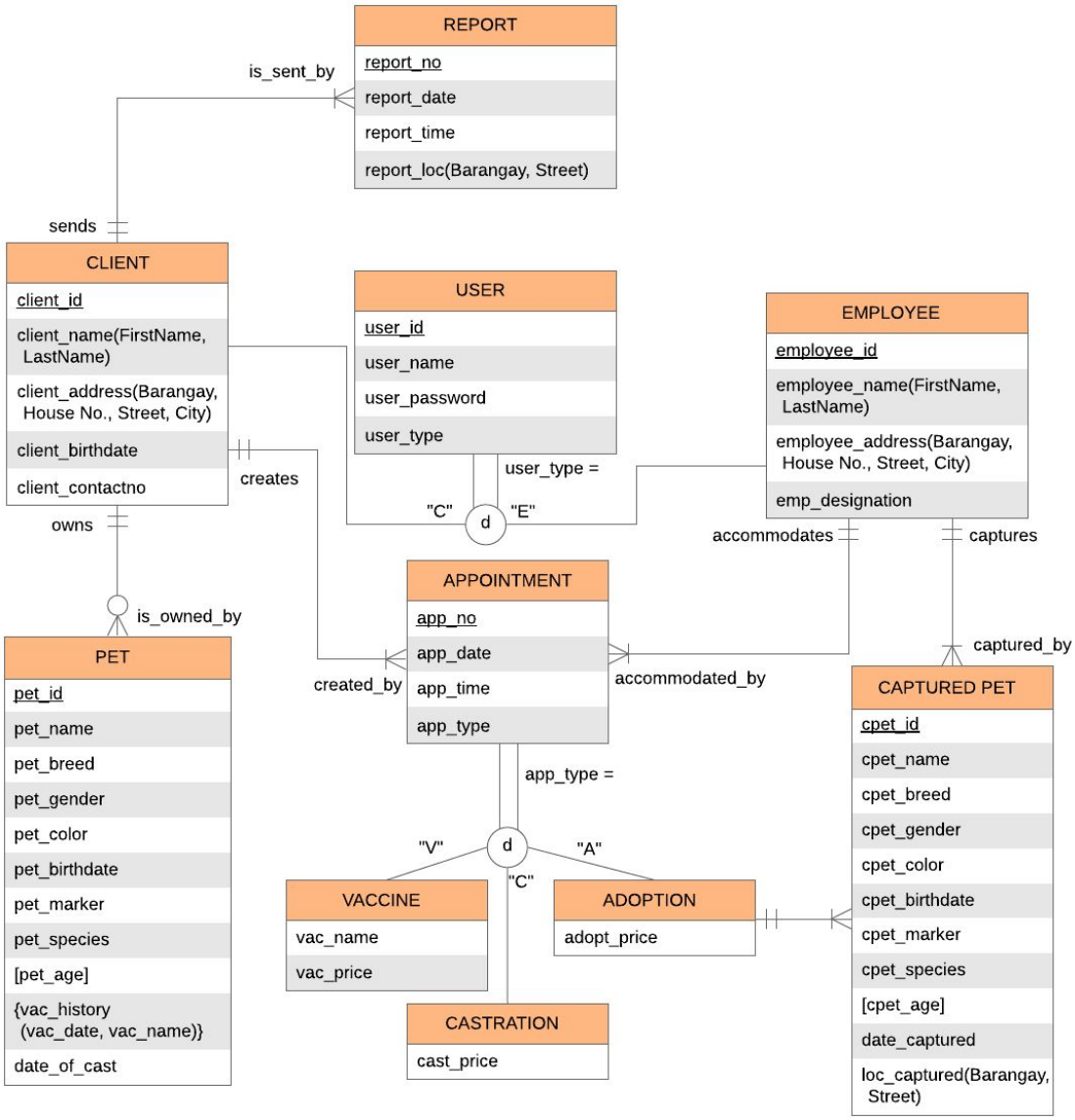
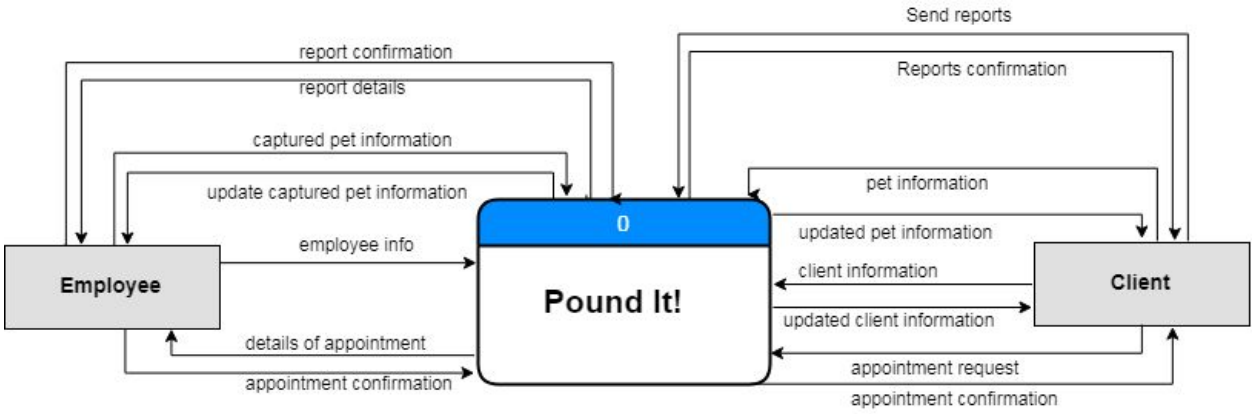


Figure 3.3 Entity Relationship Diagram

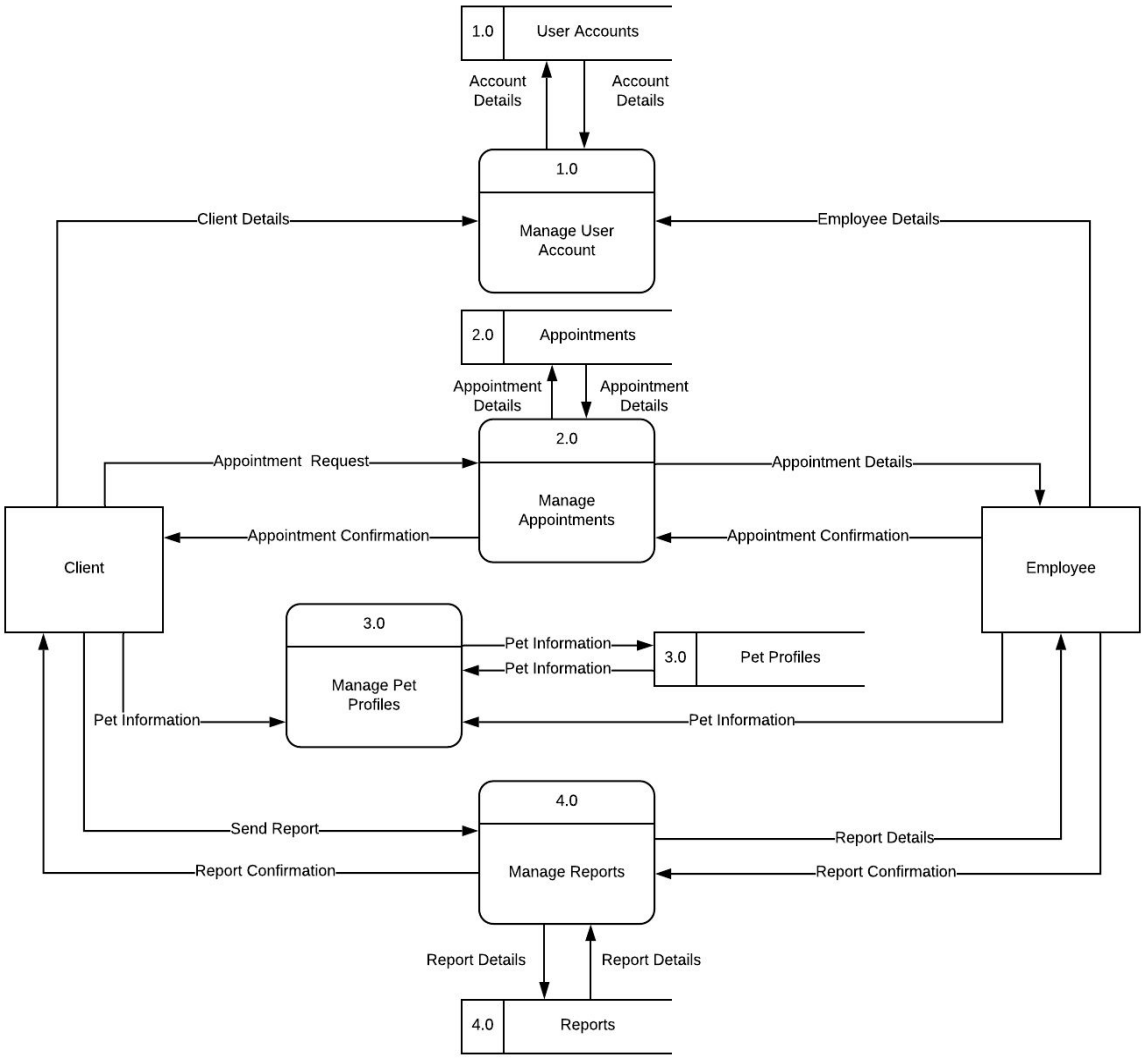
The Entity Relationship Diagram is composed of entities with its attributes and relationship to other entities. The diagram shows that a user may be an employee or a client. A client may own pets, create appointments(vaccination, castration, adoption, and surrender, send reports for stray dog catching and dog bite incidents. Only one record will be stored for each appointment. Employees are responsible for accommodating a client's appointment and capturing stray pets.

4.2.2 Context Level Data Flow Diagram



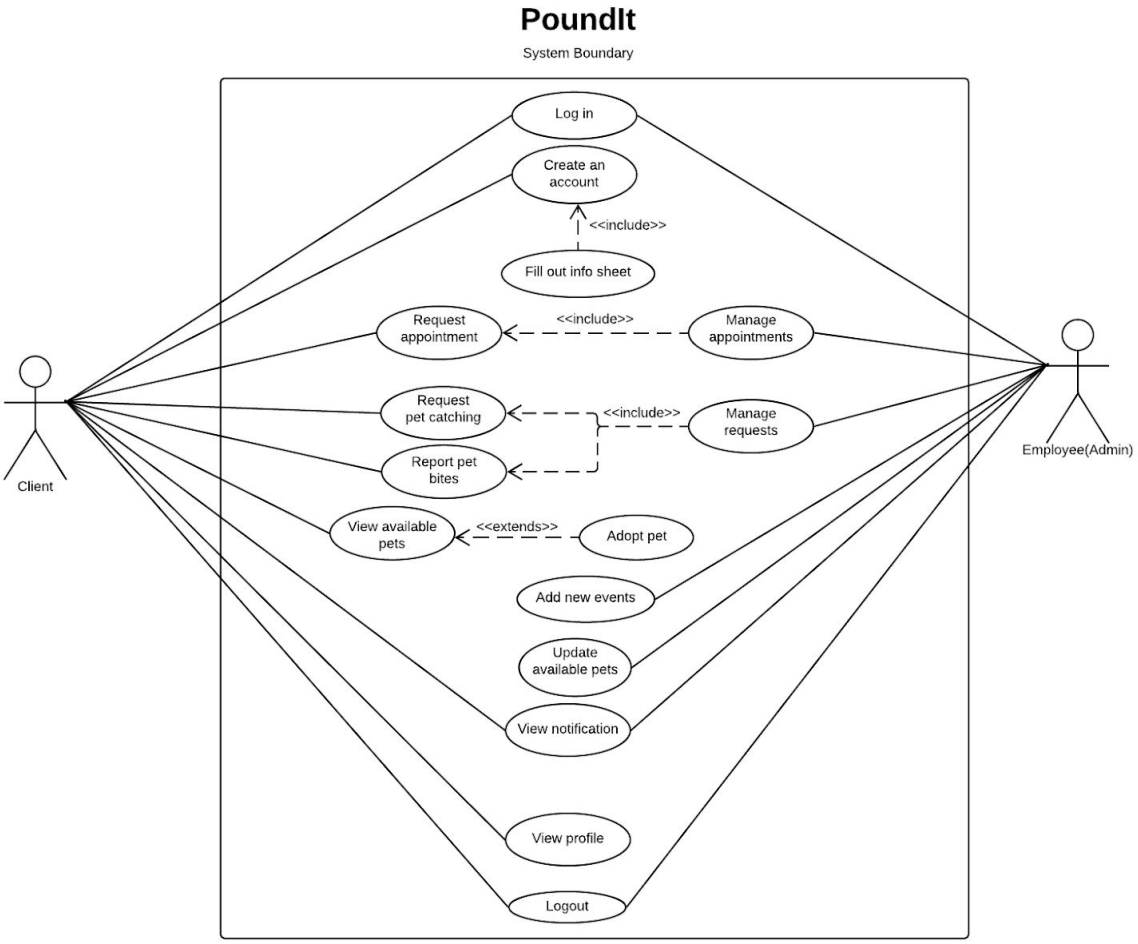
The Context Data Flow Diagram shows the flow of the data between the system, user and the admin. Registration sheet will be provided for the client in order to create an account. Once the client is already logged in, a client can create reports (request pet catching for their barangay, report dog bites, and other concerns), create a profile of their pets and create appointments. The employee will make the confirmation of the reports and the appointments. The employee will also put the captured pet information to the system.

4.2.3 Level 1 Data Flow Diagram



The level 1 Data Flow Diagram shows the processes involved within the system Pound It. Client and Employee users will be able to Manage User Account, Manage Appointments, Manage Pet Profiles and Manage Reports which comprises the main modules of the system. Data from these processes will be stored in their respective data stores.

4.2.3 Use Case Diagram



The Use Case Diagram for the website show the interaction of the user to the system. In the PoundIt website, the client can create an account and the admin will only have one account that can be used by all the employees. Both the employee and client can login , view notifications, and logout. The client will be able to send requests and reports to the admin will manage their requests and the client can also request for appointment(vaccination, castration, adoption, surrender) and the admin will manage their request. The admin can also update available pets for adoption when there are new captured or surrendered pets. They also can add new events for seminars and programs to be displayed. The user can view their profile so that they can their pets date of vaccination and their information of their pet will also be displayed in the client's profile.

4.3 Development and Testing

In development phase, the tools that are mentioned in the previous chapter will be used. Module deliverables and prototypes will have deadlines to secure progress in producing the intended output of the system. The implementation and deployment of the system is necessary to obtain feedback from the users.

4.4 Deployment

The proponents will deploy the web application using a free-hosting website. The users can access the web application through web browsers such as Google Chrome, Firefox or any other browser.

REFERENCES

[1] WHO Representative office Philippines. Rabies in the Philippines http://www.wpro.who.int/philippines/areas/communicable_diseases/rabies/continuation_rabies_area_page/en/

[2] Philippine Animal Health Information System. (2019). http://www.philahis.ahwd.ph/Pages/About

[3] The Philippine Animal Welfare Society. (2013). https://www.paws.org.ph/

[4] DOH wants Philippines rabies-free by 2030. https://www.rappler.com/nation/224976-doh-wants-philippines-rabies-free-2030

[5] Y.J.Atuman, A.B. Ogunkoya, D.A.Y. Adawa, A.J. Nok, M.B. Biallahe. (2014, June). Dog ecology, dog bites and rabies vaccination rates in Bauchi State, Nigeria. International Journal of Veterinary Science and Medicine, pp. 41-45. https://doi.org/10.1016/j.ijvsm.2014.04.001

[6] A. Bichara. (2019). Don't Ignore Homeless Animals—They Need Your Help. https://www.petaasia.com/living/companion-animals/dont-ignore-homeless-animals-they-need-help/

[7] O.S. Nag. (2017, April). Countries With The Most Dogs Worldwide. https://www.worldatlas.com/articles/countries-with-the-most-dogs-worldwide.html

[8] Rabies (2018, September). World Health Organization. https://www.who.int/news-room/fact-sheets/detail/rabies

[9] Bicol Standard. Bicol has second-highest number of rabies cases in PH. (2015, September). http://www.bicolstandard.com/2015/09/bicol-rabies-cases.html

[10] B. Thornberry, N. Harrison. Animal data management system and methods of managing animal data.

https://patents.google.com/patent/US20160063188A1/en
[11] Tambling, R.B., Johnson, L.N., Templeton, G.B. et al. Contemporary Family Therapy. An International Journal. (2007). pp. 177–183.
https://doi.org/10.1007/s10591-007-9037-z
[12] J. Martinez, RN, RM, et. al. (2018) Rabies - January 1 to June 2018. Epidemiology Beureau.
https://www.doh.gov.ph/sites/default/files/statistics/2018%20Rabies%20Surveillance%20June.pdf
[13] M. Amaku, R.A. Dias, F. Ferreira. (2010). Dynamics and Control of Stray Dog Populations. Mathematical Population Studies. An International Journal of Mathematical Demography vol. 17, (2010) pp. 69-78.
https://doi.org/10.1080/08898481003689452
[14] Companion Animal Adoption Study
https://www.tandfonline.com/doi/abs/10.1207/S15327604JAWS0503_02
[15] D. Briggs. (2012). The role of vaccination in rabies prevention.
https://doi.org/10.1016/j.coviro.2012.03.007
[16] Information management system for rabies prevention and disposition outpatient department
https://patents.google.com/patent/CN107292077A/en?q=rabies&q=prevention&oq=rabies+prevention
[17] B. Dodet, A. Goswami, A. Gunasekera, et.al. (2008). Rabies awareness in Asian Countries.
https://doi.org/10.1016/j.vaccine.2008.09.003
[18] What is CSS3?
https://medium.com/beginners-guide-to-mobile-web-development/whats-new-in-css-3-dcd7fa6122e1
[19] Javascript. MDN web docs.
https://developer.mozilla.org/en-US/docs/Web/JavaScript
[20] What is XAMPP?
https://www.apachefriends.org/index.html
[21] What is Apache?
https://www.wpbeginner.com/glossary/apache/
[22] What is MySQL?
https://www.w3schools.com/php/php_mysql_intro.asp
[23] "A vocabulary and associated APIs for HTML and XHTML". World Wide Web Consortium (W3C).
https://www.w3.org/TR/html52/
[24] Bootstrap.
https://getbootstrap.com/
[25] Oplan ‘Dog-hang’ killing dogs
https://pop.inquirer.net/58954/oplan-doghang-killing-dogs-paws