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Dogs Health Care Management System

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ABSTRACT

Web based applications have become an important part of daily life as it improves inefficient resources management while saving time. With the advancement of technology, every business sector tries to introduce software systems with smart features Life has become too busy to schedule and keep up with pets' necessary medical appointments and care. There are currently a smaller number of online applications for veterinary systems. So, this study designs an online system to fill up that research gap. In this project, a JavaScript based application is designed with features such as booking an appointment by checking a doctor's availability and all those details are going to store in a database. This also records all the details of the dogs that come to the hospital for daily treatments. With the help of daily clinical data, veterinary health care owners can easily identify active clients and give offers easily. Moreover, newly introduced features are caused to increase the efficiency and maintenance of the system. However, this application addresses not only the pet lovers' difficulties regarding the veterinary health, but it also addresses management side problems as well. This system is designed and implemented not only for the pets, but also considering orphan dogs. So, this system provides volunteer service as well.

Keywords-- Web Application, REST, Notification System, Veterinary Management

I. INTRODUCTION

Animal healthcare is also more important as well as human health. When we consider animal health care, veterinaries play a key role in animal healthcare. This system mainly provides efficient service to dog owners, veterinaries, animal pharmaceuticals and animals. The online healthcare system offers more benefits than the manual on going veterinary process. The major goal of this system is to create and develop a web-based application to address and resolve issues that arise during the business's present manual operation. If dogs are ill and want to visit a veterinary surgeon for a check-up, dogs' owners need to visit the hospital and wait until the veterinarian is available. During appointments scheduling, the owners must also wait in a queue. If the doctor cancels the appointment due to an emergency, the patient won't be informed until after arriving at the hospital. So, that manual process is an inefficient process. Another thing is that this system can also be used to avoid difficulties in handling the medicines store. The general and health related details of dogs are also recorded through this system. A new feature called dog adoption management has also been introduced from this system.

Basically, this system is used by admin, doctors and the receptionist of the system. All those users need to login to the system. System is maintaining an inventory data about medicine and vaccines count, appointments management, animal history records for each animal and there is another newly introduced feature called adoption management. The system has some special features to generate reports for management purposes. Mainly this system makes the veterinary center easier and avoids the problems faced in manual systems such as appointment delays, last-minute cancellations and last-minute rush. The people who want to request an orphan dog can make their request easily through this system.

This paper is organized as follows: The literature review is discussed in the next section. The methodology of the system is presented in section III of the paper. The proposed system is explained under section IV. The discussion about the system is explained under section V. Finally, section VI presents the conclusion.

II. RELATED WORKS

The process of notifications management and the veterinary information management [4] of animal healthcare is discussed by Shiavni Shirole in Smart Veterinary Management System.[3] Advanced information of veterinary community clinics and dog history records are used at the implementation of doggie care health prediction system. System capable of storing the history of the dogs, storing history of medicines approved by doctors for a

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specific dog. Based on previous data, the system provides a health status report and provides suggestions for the next clinical requirements after an analysis, which is not discussed at the Smart Veterinary Management system research paper. Shareability of the information provides more integration with the current and future functions.

An IoT-inspired Cloud-based Web Service Architecture for e-Health Applications by Lotero Pescosolido and Riccardo Berta, gave us backend implementing information about web-based e-health applications. REST-API, hosted database, infrastructure of the cloud platform, and web portal, interoperates with the process of notification and alert system of the innovative system. It provides the opportunity to the end-users to verify the appointment details, cancellations and the dog orphan details via SMS or email. Extension of devices such as environmental sensors and monitoring devices features the connection between health care application and IoT world. Within those resources, the accuracy of the reports makes it more reliable and accurate. [1]

III. METHODOLOGY

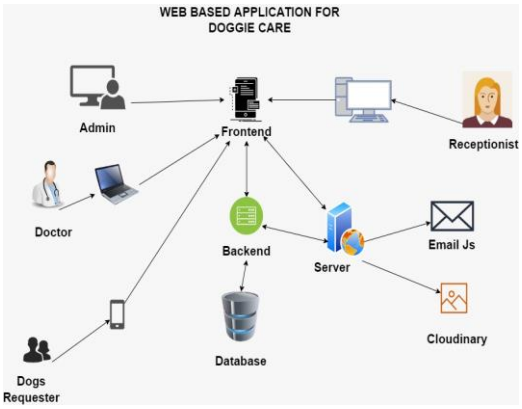

Figure 1: Overview diagram

The developing Web-based Management System of "Doggie Care" would primarily be composed of three main components, as shown in the system overview in the above figure 1: The Web Server, the Front-End (developed by React JS), and the Back end (developed by node JS and express), connected to the System database that will be developed by the MongoDB. The employees will be given varying levels of access permissions to use the system.

However, all these actors can only access the front-end of the system through which they are facilitated to use the database without giving access to the back end. During the system development process, members will use the GIT HUB repository to integrate the developed tasks

The system mainly includes 4 main actors as administrator, doctor, dog requester and receptionist as mentioned in figure 2: Furthermore, administrators will be involved with key tasks such as data entry and handling report generation requests. Employees working within the dog care center will use the system in relation to the access authorizations they have received.

The dog health care system used several tools and technologies. To develop this system, agile software development methodology was used. draw.io was taken as the UML designing tool. Figma was used to design user interface and user experience. MongoDB Compass was used for data modeling. Also, azure board is used as the project management tool. Postman and Selenium could be use as testing tools. SonarQube is used for continuous inspection of code quality to perform automatic reviews with static analysis of code to detect bugs, code smells, and security vulnerabilities. Java Script was used as a major programming language. Also, React JS is used as UI and web development library. Not only that Node JS is used as server-side development framework. Bootstrap and Oauth2 security mechanism used as web technologies. Rabbit.mq used for message passing (messaging middleware). Visual studio code used as IDE. Git used for version control. Amazon Web Services used as cloud provider.

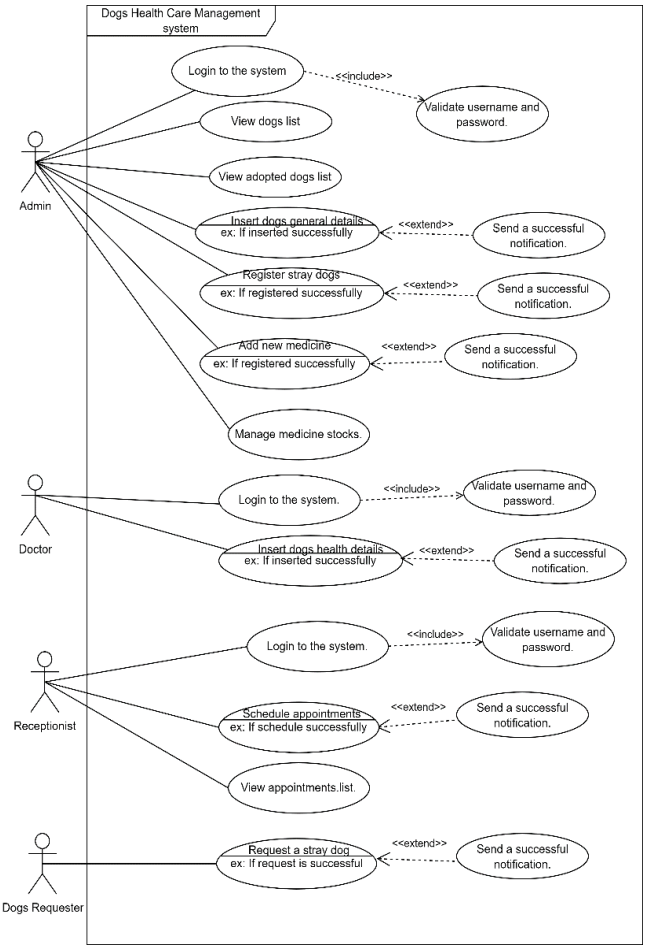

Figure 2: Use case diagram

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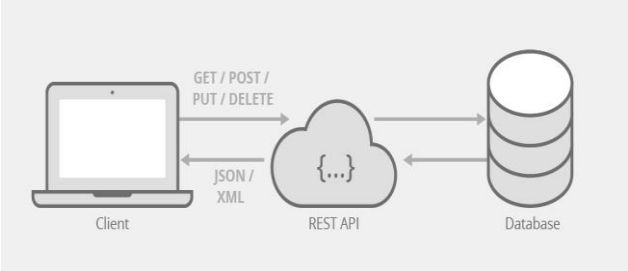

Figure 3: Backend diagram

The application was built using the REST approach. The service interfaces only used resources with a certain Uniform Resource Identifier (URI). All resources are accessible by utilizing the semantics of the accepted HTTP methods such as (GET, POST, PUT, PATCH and DELETE), without creating other verbs. [1] All the views connected with the database through the backend shown in figure 3: This application has a separate notification system, and this system uses Twilio and email JS as external API. Not only that, but this system also uses 'Cloudinary' to store images.

IV. PROPOSED SYSTEM

A. Manage Appointments

The authorized receptionist of the system can add the appointments according to the preferred date/time of dog owners. From that, the system records appointment date, time, owner's NIC, dog's disease. The selected date/time slot will be reserved, and the dog owner will receive the notification of the successfully added appointment [2]. After, doctors and receptionist can view the list of all appointments from the system. [4] As well as receptionists can get further details about an appointment by clicking the specific one. Through this system receptionists can search specific appointment by giving appointment ID. Also, this system facilitates the editing of appointments whenever owners need. Also, if they need to remove old appointments from the system, they can do that easily by clicking the delete button in the system. Another special feature is the system that allows them to generate the appointments report, which can be daily or monthly. A new function created by this system is the notification system. That is, when the dog owner makes an appointment, the system sends a message or an email to the owner to remind him when the date is near. Also, if a doctor is unable to come due to an emergency on the day of the appointment, the system will send notifications to the dog owner about his absence early.

B. Manage Dog Details / Dog Prescriptions

First of all, the authorized admin registers the dogs that come for treatments in the system. From there, the dog is assigned with a unique id. And also, owner's name, address, date of birth, sex, an image and breed are recorded. After the treatment, the doctor enters the health-related information of the dogs into the system. There, all details such as disease, medicines used, lab tests done, weight, blood group, last visited date and next date etc. are entered into the system. Later, the details of all those dogs can be retrieved from the database. If the admin wants to get the details of only one specific dog easily, by clicking the view one icon, admin can view only those relevant details. The other thing is that they can search for a dog by typing the specific id of a dog in the search bar. If the admin wants to edit the details of the dogs again, this system also facilitates that. Also, if it seems necessary to remove dogs who came for treatments a long time ago from the system, they have also been allowed to do so. The other special point is that this system also enables generating reports about the dogs' health history. There, the information such as dog name, medicine taken by the dog, disease, weight, the date of arrival, and lab tests etc. is entered in the report. The user is also given the ability to download the report as a pdf from the system. A new function created by this system is that health reports can be sent to the dog owner's email address as a pdf.

C. Manage Dog Adoption

Initially, the administrator can input the details of the rescuer and puppy to register the stray dog in the system. The database can be used to retrieve the information about the rescued puppy. If an administrator wishes to find a specific dog record, they should search through the appropriate dog records and enter the dog's name or registered date in the search field. The system then makes it easy to update the information on any currently rescued puppies based on the circumstances. The other point is that this system generates reports about the dogs' details card according to medical history. The user is also given the ability to download the report as a pdf from the system.

This system's new feature allows dog requesters to fill out a form outlining their requirements, and the system will assist them in selecting the appropriate pet based on those needs. If you find an animal you want to adopt, the system ensures that two of you are a good fit. The email address of the person who requested the dog will automatically receive notification of this. You will receive a medical history report including immunizations, medications, and procedures when you adopt an animal from Doggie Care. Your adopted pet's information is readily available on our system. We will also go through the animal's behavioral and medical records during this process, go over adoption policies, and describe the services that are offered.

The admin can add the details of new Parents names, contact number and their address as well as puppy's details. After entering the required values, Admin can view

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list of adoption details as well as generate monthly Puppy adoption report.

D. Manage Dog Medicine Store

The authorized admin can add new medicine and its details to the system. The system keeps all the medicine details (name, quantity, expiry date, category, description, image etc.) and stock count [3]. By looking at medicine stock admin can get idea of the medicine stock. Ex: can view expiry dates easily. Also, admin can get further details of each medicine by clicking the image of the medicine. In here Stock count becomes empty admin will be notified by the system. It could be easy to handle admin's day today tasks. Through this system admin can search specific medicine by entering its name or medicine category (vaccine, tablets etc.). This system also facilitates editing entered medicine details. Also, if it seems necessary to remove medicine which became outdated for treatments, they have also been allowed to do so. The other special point is that this system also enables generating monthly or annual sales reports. Admin is also given the ability to download the report as a pdf from the system.

V. DISCUSSION

Concept of dog adoption management, health prediction reports and notification and alert systems are highlighted in this system. When we consider the dog adoption management function, we need to input all the details to the database. Dog height, weight, injuries, color, variety and behaviors when an orphan dog adds to the system. Dog requesters also need to input the preferences. After matching details, the system automates an output to the requester and to the system admin. Then the manual procedure continues. If there is no match between requester and the data inside the database, input data will be added to a specific database. This platform is interoperating with both partisans. Figure 4 describes the flow of the above function.

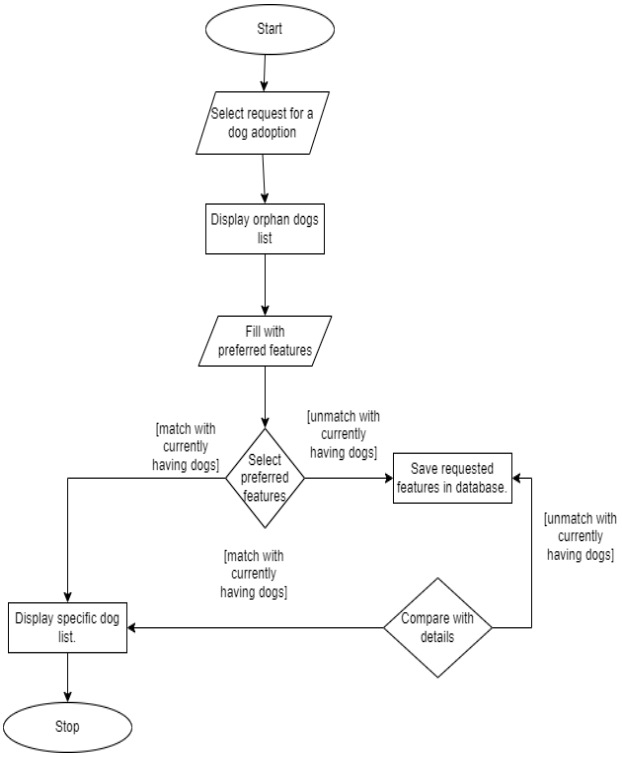

Figure 4: Logical flow of orphan dog flowchart

Another important function is the giving health predictions and reports about dogs with the measurement of the heartrate, blood pressure, eye checkouts and blood sugar with the IoT devices. Within this function it provides more accurate and reliable reports to the clients (advanced algorithms and deep learning). This concept is very useful for the animal care industry. System giving suggestion dates to take vaccines and medicines according to the reports. All data will be derived by their features and all stored in cloud platforms. Because of the sharable options, dog owners can quickly log into their accounts and can get the history records in a serious manner.

VI. CONCLUSION

Mainly this system is a web-based system, but dog requesters can request dogs through the mobile phone. This system helps to overcome major issues in managing appointments, prescriptions, dog adaptations and medicine stores. The dog prediction feature offers an effective solution to the dog requesters. This system keeps dog prescriptions, it will be easy for the doctors to identify diseases and treat the dogs. On the other hand, by using this system, dog owners can make appointments and attend dog clinics in an efficient way. Each dog owner, along with their pet, has a profile with information on additional needs, immunization records, and emergency contact information.

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Each profile allows you to attach files, so you can keep all your paperwork in one location.

Booking reminders, appointment confirmations, vaccination alerts, and any other information that we want our consumers to be aware of will be sent to them. We utilize personalized emails with our company's branding. The dog adoption management part mainly focuses on connecting with dog requesters and rehoming rescued puppies. The system will suggest the puppies based on the dog requester's requirements to them. Through this system, dog owners, dog requesters, administrators and doctors can manage their daily tasks smoothly and easily. Nowadays, information technology plays a major role in veterinary and medical industry. This dog healthcare management system can be further enhanced by including scanning features.

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