

PetTag System

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Abstract: Many Malaysians keep cats as pets. However, it is quite a challenge to do so because of the various issues involving cats care. This includes the issues of loss, theft, and accidents that are completely unforeseeable by cat owners. This system is named as PetTag system and it was developed using prototype model method. It aims to solve the issues that arise and help cat owners to be able to monitor their cats easier and efficiently. This system has RFID technology installed along with the ESP32 that is placed at the cage door for the cage entry system. The owner can see the status of the cat in the system whether it is in or out of the cage. All programming of electronic components uses Arduino IDE as the main platform. This system uses MySQL as the database to store data. This PetTag system also have QR code that will bring up the contact information of the cat's owner. Overall, this PetTag system will be the innovation that all cat owners have been waiting for to help them in monitoring their cats with ease and efficiency.

Keywords: System; Monitoring Cats; Arduino IDE; Prototype; database.



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1. INTRODUCTION

Having a cat as a pet is very popular in Malaysia and is widespread in society. Various efforts and efforts of owners to ensure the safety of their beloved cats. Some owners are willing to spend hundreds to thousands of ringgits just for their cats and pets. But bad things still happen to them. A cat owner providing a cage is one of her wise measures. However, the problem of other cats entering the cage, especially the neighbour's cat, is very uncomfortable. Food specifically available for these pet cats to eat, or worse, to hand out to strange cats. This problem is one of the major problems facing cat owners. For cat owners, taking measures to put a lock on the cage always makes it more difficult for the cat to have to repeatedly open and close the cage to get in and out of it. In addition, it is not uncommon for cats in the neighbourhood to disappear if left unattended for a long period of time, especially during seasonal festivals or consecutive holidays. For this reason, there is also concern among some cat owners that they take the initiative to keep their cats in cages all the time. Remove the cat only if you just want to play with it. This is because cat owners are concerned that cats may stray too far to be tracked. This is very inappropriate and relevant because cats also have their own rhythms of life. Another problem faced by owners is that of cats getting lost or not found when they are allowed to roam freely outside residential areas. Care of this small animal is very difficult due to its agile and active movements. Therefore, constant monitoring and operation is extremely difficult. Cats that are

generally found do not know their owners. Also, owners do not know if their cat has had an accident or an accident.

2. METHOD & MATERIAL

The scope of the project study developed is as follows:

- a. **Admin: Administrators** are company staff who will register new cat owners and delete records if the cat owner no longer uses the PetTag service.
- b. **Cat Owner:** Cat owners involved in this system are pet cat owners. Cat owners are mainly focused on cat owners in residential areas.
- c. **RFID device:** The main electronic equipment in the successful development of this system is the RFID device that is placed on the cat's neck chain and the cage door. This RFID system is equipped with 2 tools which are tags and readers. The tag will be attached to the cat's neck chain while the RFID reader is placed on the cage door. When the RFID tag is in the radio frequency range produced by the RFID reader, the RFID reader will activate and send radio waves to induce electric current in the RFID tag on the cat chain. A passive device that is an RFID tag placed on a cat's collar does not require any power source, instead it is built to activate and start sending their signal when exposed to a change in the magnetic field.
- d. **Cat model:** A toy cat will be if acts as a cat model or an object to be moved close to the cage door to demonstrate the door opening using the RFID device. This cat model will also be moved several times through the cage door for a demonstration of entry and exit counts using sensors that will be displayed in the system.
- e. **QR code:** QR code stickers will be attached to the surface of the RFID chip for public use. When scanned, it will lead to the cat's details along with the owner's phone number and email. So, members of the public can contact the owner of the cat when they find it wandering around or something untoward happens.

Figure 1 shows the architecture diagram of PetTag system.

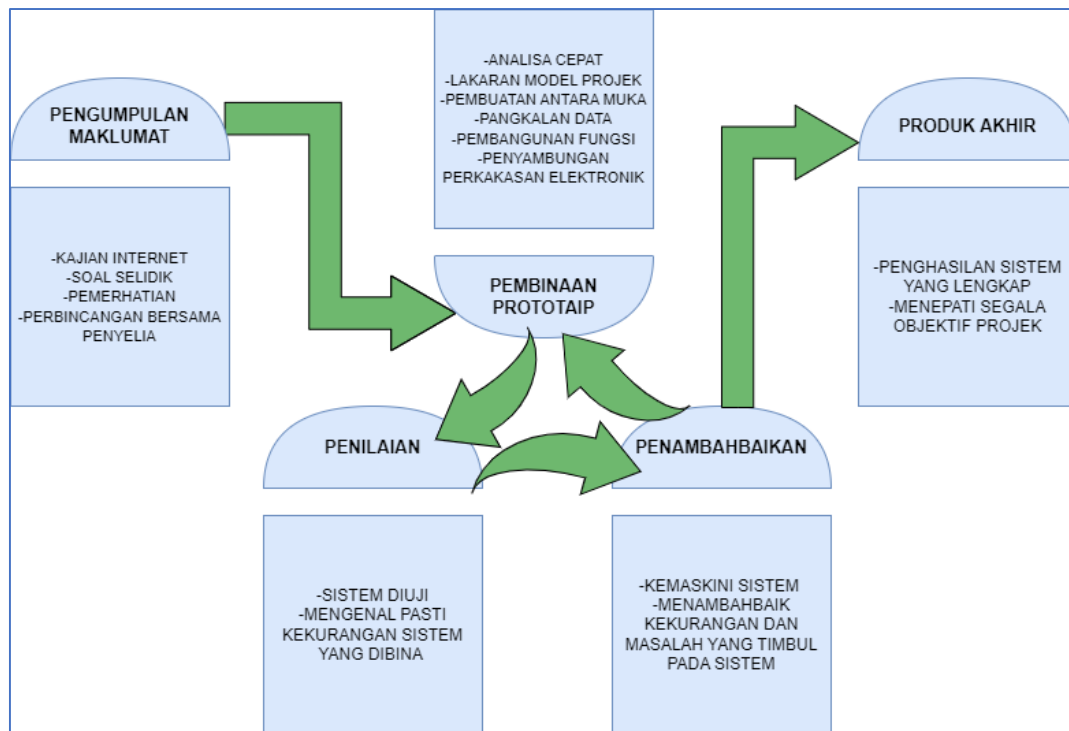


Figure 1. Architecture Diagram of PetTag System

3. FINDINGS

This comparison shows some differences between the developed system and existing equivalent systems. The PetTag system will be developed based on the website as the main platform. Accessing and using this system requires the chat owner or administrator to enter the registered username and password. All data and passwords of chat owners and administrators cannot be viewed or changed by third parties. In addition, this developed website will display the pet cat's status, the "IN" status when the cat enters, or the "EXIT" status when the cat leaves the cage. Based on the developed PetTag system, the cage door is equipped with an RFID device to grant access only to the card or the cardholder. Sensors are also placed inside the cage to detect the cat's movements and then send the cat's entry and exit status to the website. The QR code on the label is for general use. A QR code that includes information the owner requires, such as the cat's name, name and owner's phone number for the public to contact when they find the lost cat, or something is up. happen. Figure 2 shows the architecture diagram of the PetTag system. Figure 3 shows the summary of the analysis phase.

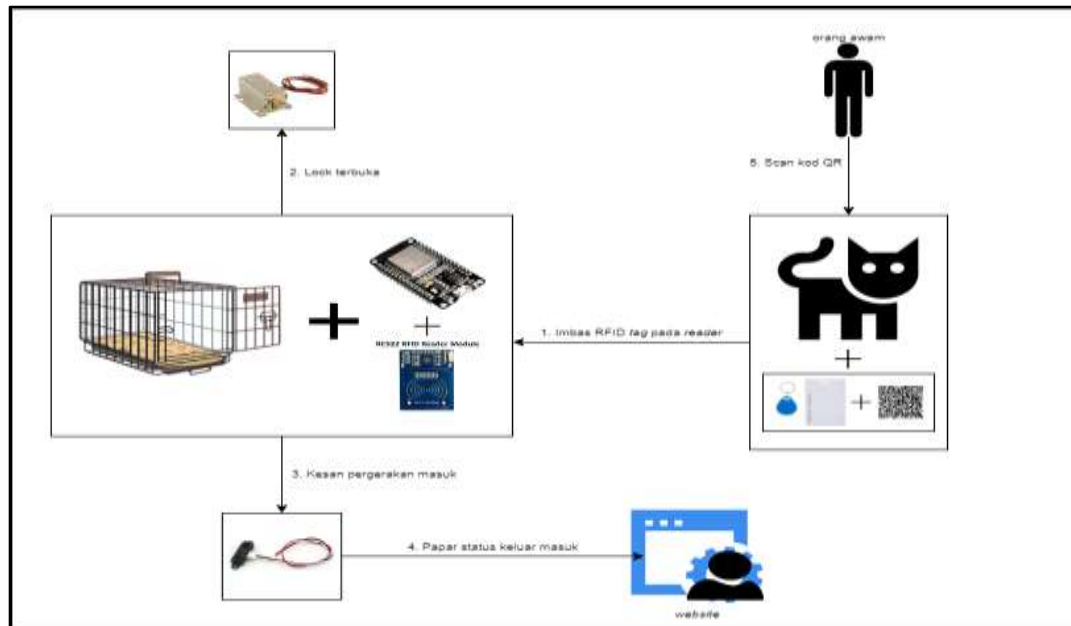


Figure 2. Architecture Diagram of PetTag System

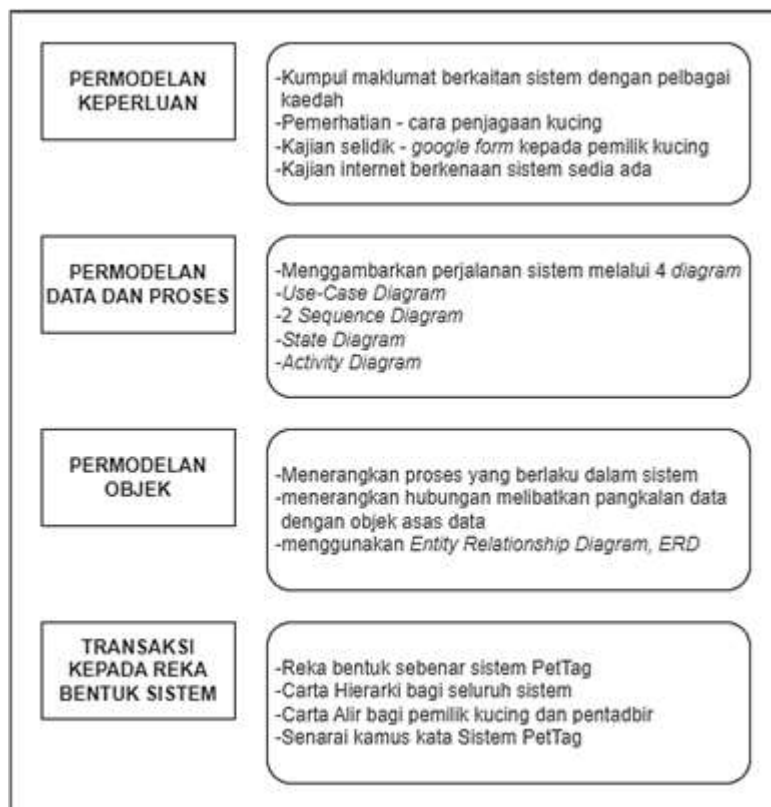


Figure 3. Process in Analysis Phase

Figure 4 shows the Use case diagram and the sequence diagram of Pet Tag System is shown in Figure 5.

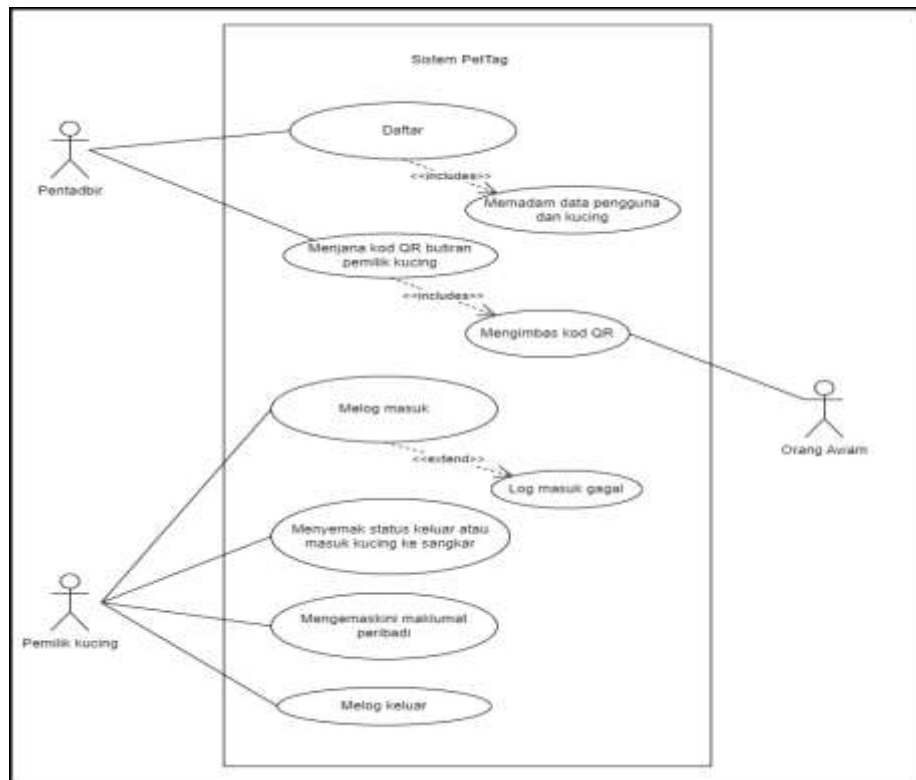


Figure 4. Use Case Diagram of PetTag System

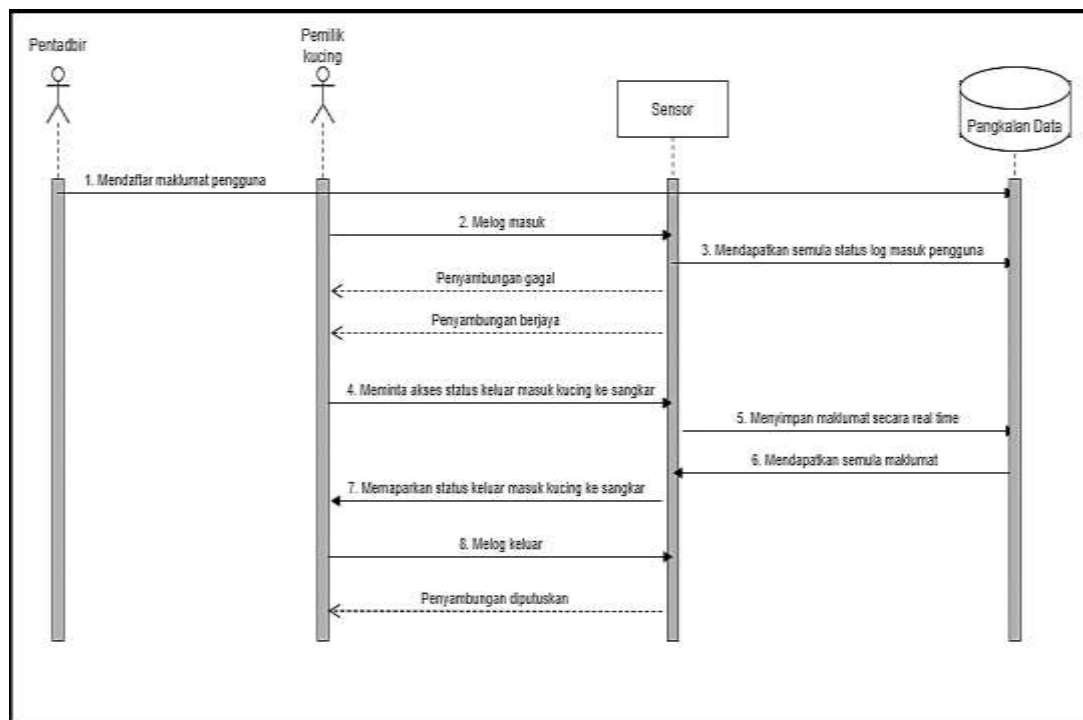


Figure 5. Sequence Diagram of PetTag System

Figure 6 shows the hierarchy diagram for PetTag System.

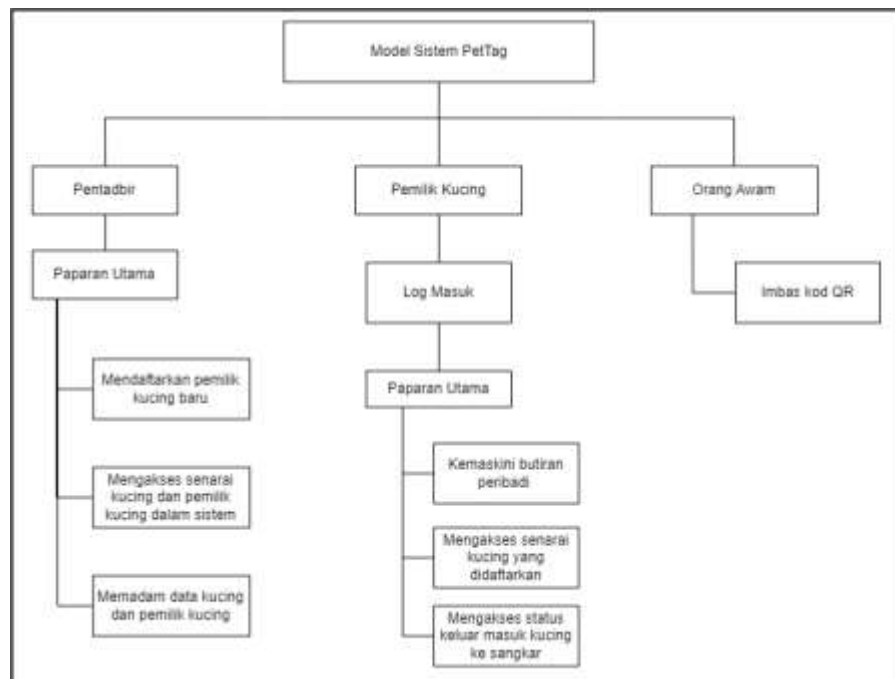


Figure 6. Hierarchy Chart of PetTag System

Figure 7 shows the electronic circuit of PetTag System.

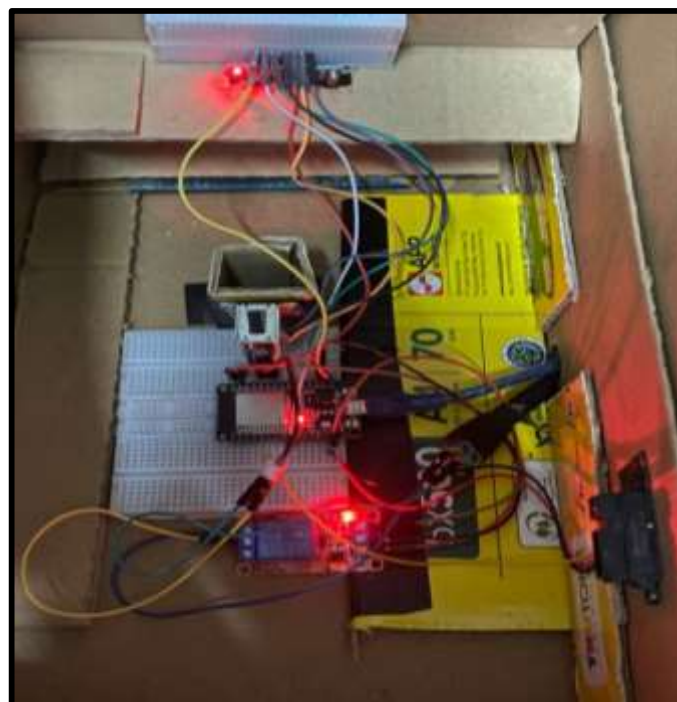


Figure 7. Electronic Circuit of PetTag System

Figure 8 shows the Pettag System Main page.

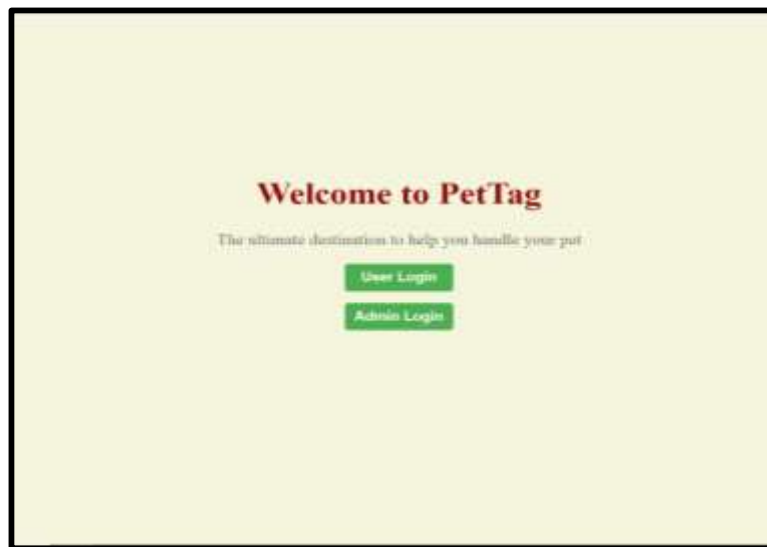


Figure 8. Front Page of PetTag System Web Page

4. DISCUSSION

4.1 *The Importance of the Project*

Most cat owners are forced to leave their pet cats at home especially on every weekday. There are some owners who will let their cats move freely and carry out their own routines. The owner will take the step of attaching a specific neck chain as a sign that the cat already has an owner to prevent it from being taken by someone else. There are also some owners who do not want to release it from the cage for fear of losing their beloved cat. Although there are IoT-based systems innovated to be used to solve this problem, the prices placed on these devices are quite high and unaffordable. Therefore, the method that is the choice of most cat owners to ensure the safety of their pet cat is still the same from time immemorial which is to either install a neck chain or lock the cat in a cage.

A system development will be implemented to overcome the protracted conflict. The system, known as the Cat Neck Chain System (PetTag) will make it easier for all cat owners. Along with the Industrial Revolution 4.0, the purpose of PetTag's development was to enable cat owners to know and monitor the movements of their pet cats. In addition to making things easier, it can also save the cat owner time. In terms of security, cat owners need to log in to the system using the ID number and password that has been registered by the system administrator. Therefore, only cat owners who use the services of this system are allowed to access the system.

The PetTag system has criteria that can provide comfort to users i.e. cat owners in managing and monitoring their cats more easily. This is because users only need to see their cat's current status on a smart device, e.g. a smartphone. Therefore, the achievement in the development of this system is measured through the project objectives set out in Chapter 1. The objectives of this system are achieved if:

- a) Design and develop the PetTag system using the IoT concept online to make it easier for cat owners to monitor the movements of their pet cats.
- b) Builds a database system that gives cat owners access to monitor the status of the cat's entry and exit to the cage.
- c) Generates QR code generation in a system equipped with owner details for each cat registered.
- d) Testing developed systems to ensure they are error-free and working properly.

A system developed has its own advantages and attractiveness depending on the objectives and scope of development of the system based on the needs of the targeted users. Here are the advantages of the PetTag System:

- a) User-friendly and easy-to-understand interface. All displays and buttons found on the interface of this system work according to the wishes and needs of the user.
- b) The status of a pet cat can be known in real time. So, cat owners can monitor domestic cats all the time.
- c) Only registered users can access this system. Only administrators can register new users to be given access to the system.

5. CONCLUSION

Finally, it can be summarized that the development of the PetTag system has achieved the goals, objectives, and scope of the project, as outlined in the beginning of this project. A systematic and based framework on a planned schedule that allows the system to grow as hoped. The PetTag system is highly desired by cat owners to implement and use because it can solve cat care problems that cat owners face. In the future, we already identified some improvement that can be made to enhance and make this system work better.

- a) Installing appropriate camera components to display in real time the movements of the cat in the cage.
- b) Creating a notification transmission system to the user when there is a change in the status of the cat detected by the sensor.
- c) Develop a notification system to users and administrators when the system server is unable to function properly or server down at that time.
- d) Replacing the IR sensor with a Movement sensor to make the movement detection of the cat in the cage more efficient.

The recommendations highlighted are important so that the system improvement process can be implemented comprehensively and from time to time. This allows the developed system to be used by users over a long period of time as system improvements are carried out on a regular basis. This makes the system remain relevant and continue to be used.

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