Dog Chain – A Blockchain Enabled Record Keeping for Your Dogs

Abstract

In many countries, the pet animals are given a certificate. This certificate is used to get information such as their breed, lineage, ownership details etc. In India, certificate for dogs are given by Kennel Club of India (KCI). It is the official authority to provide identity for your pet dogs. Only the dogs with certificate can compete in tournaments organized by KCI, and the ones with the certificate are given more value. Especially those dogs who have won those tournaments and became champions and their children have more price than ordinary dogs. These certificates also have legal value.

Keeping the medical records for the dogs is very important. This medical record includs information about vaccination, and treatment data for any kind of illness or accidents. It will help the veterinary doctor to trace any kind of previous illness that may helps to give proper treatment to the dog.

Through this project, I am looking forward to combine these two data together to form a distributed ledger using blockchain technology.

Current Scenerio

The Kennel Club of India maintains the Dog Breed Standard in India. Registering your dog with KCI is quite easy and simple. KCI registration provides you peace of mind. With your registration papers, you can rest easy that your puppy is pure bred pup and is worth all your patience, effort and energy invested. KCI registration is also required for participation in confirmation shows and KCI obedience shows.

Your pup's registration can also come in very handy, if you choose to breed your puppy at a latter point of time.

KCI allows for two kinds of registrations for dogs bred in India. Following are, two types of registration are available for dogs bred in India.

Litter Registration

As the name suggests, this process is available for puppies born for registered dogs. Both the Sire and Dam must be registered with the KCI and bear the KCI approved microchip.

The form once completed, should be sent along with the applicable registration fee per puppy. The fee varies depending on the age of the puppy. The litter registration form should reach KCI within 90 days/ 4 months from the date of birth of the puppies failing which the puppies will be registered in unknown parentage.

The demand draft must be drawn in favour of "Kennel Club of India" payable at Chennai. If you are not a subscriber of the `Indian Kennel Gazette', it is mandatory to subscribe for the same. You can download the subscription form from the "Downloads Section" of KCI's website.

Single Dog Registration

This category is for dogs that have an unknown parentage. For single dog registration, the dog must be certified by an authorised person who will provide you a Certificate of Opinion. Dogs registered under this process will be shown to have unknown parentage. Even if you are aware of the actual parentage of the dog it cannot be reflected in the certificate, under this scheme, as the breeder failed to register the pup under the process of litter registration.

Certificate of Opinion

In addition to the standard form for single dog registration process, KCI has authorized all judges and certain other people to certify that a particular dog is fit for registration as a specimen of a breed. This is the process of "Certificate of Opinion". Following are some key things to keep in mind for this process:

- The dog needs to be over one year of age.
- The dog needs to be microchipped and the same will be updated on the KCI registration document
- A male dog cannot be certified if he has been neutered.
- The dog needs to be worthy of a title of 'Champion' in its breed, through a registered club.

The process of Certificate of Opinion is very direct and simple. However, you need to know that mere application does not guarantee that your dog will be registered through this process. The strict standards ensure that this does not turn into a money making scheme.

Transfer of ownership

To complete the process of registration for your puppy, you must also finally fill the "Transfer of Ownership" form. The breeder will typically provide your the initial litter registration documents. You will then need to transfer the ownership of the puppy in your name. This is an extremely important step if you intend to participate in dog shows and/or breed your dog.

Method used by KCI

The KCI uses both paper storage, and centralized server method to store all the information about the certificates. We can retreive the information about a dog, if we scans the microchip. All the KCI centers and some KCI approved veterinary hospitals have microchip scanners. And we can get a new microchip if it is lost. We just have to submit the certificate.

Keeping the Medical Record

Keeping the medical records for the dogs is a hectic job. Either the dog owner or the hospitals have to do that part. Most of the time, dog owners stores the medical data. And the medical data is stored in papers. Each time your dog is vaccinated, the doctor certifies in that paper with signature.

Proposed Solution

In this project, I am suggesting the blockchain technology to combine both certificate and medical data. As I am looking for to making this project in small scale, I am only including a small number of stakeholders in this project. They are:

1. Dog
2. Dog owner
3. Veterinary doctor
4. KCI authority

Dog

Following are the events in the life of a dog that is going to be documented.

- **Birth**

    At birth, the pups are registered to the system. Both litter registration and single registration are documented seperate manner. In case of litter registration, both parents fields are entered. In case of single registration, either one of the parents or both of them are given as unknown pedigree. And other thing documented are birth date, breed, colour, name of the breeder. Here, the breeder will become the first owner. This process is documented by the owner/breeder of the puppys. This certification process have to be verified by the KCI authority.

- **Vaccination**

    Vaccination at the correct time is essential for the safety for both the dog and the owner. The vaccination is done by the veterinary doctor. Here the data documented are : the type of vaccine, current age of the dog, name of the doctor etc. This process is documented by the veterinary doctor.

- **Treatment**

    Treatment is done for any kind of illness or accidents. Here the data documented are : the reason for treatment, name of the doctor who conducted the evaluation, doctor's observation, medicines prescribed etc. This is also done by the veterinary doctor.

Dog Owner

Following are the events in the life of a dog owner which are going to be documented.

- **Dog Owner Registration**

    In this process the owner registers to the system. This registration process is completed only if the KCI authority approves the membership request of the dog owner to the system. An owner can have a pet dog, only after the registration process is completed.

- **Birth Registration**

    Birth registration is the initial process in which a dog is introduced to the system. The dog owner conducts this event. Two types of events are there: certificate for litter, which both the parents of the puppy is registered in the system, and certificate for a single dog, in which either one of the parent, or both parents are not registered in the system. Here the breeder is taken as the initial owner of the puppy. In this process, the dog is given a unique number to print in the certificate, and in the microchip. This process have to be approved by the KCI authority.

- **Ownership Transfer**

    This process is done when the current owner of the dog, sells that dog to another dog owner. In this case, both of them have to be registered in the system. This process is initated by the current owner. The data acquired are the names of the two owners, name and chid id of the dog, date of ownership transfer. This process also have to be verified by KCI authority.

Veterinary Doctor

Following are the events in the life of a veterinary doctor which is documented in the proposed system.

- **Veterinary Doctor Registration**

    In this process, the doctor is registered into the system. The data required to do this process are name of the doctor, name of the hospital that he/she is working in etc. This registration process have to be verified by the KCI authority.

- **Vaccination**

    In this process, the doctor vaccinates the dog. The datas required for this process are name and breed of the dog, name of the owner, dog's chip id, age of the dog, whether the process is conducted at the hospital or owner's home etc.

- **Treatment**

    In this process, the dog is admitted to the hospital due to some kind of illness or any accidents happens. The doctor checks the dog thoroughly, and stores the evaluation data to the system. The data includes name, age and breed of the dog, name of the owner, primary signs of illness, cause of illness, medicines prescribed etc.

KCI Authority

This is the governing authority of this system. The registration of new users and dogs to the system is approved by KCI authority. And also the selling of dogs and transfering their ownership is also regulated by KCI. These are the events that happens in the life of KCI authority.

- **KCI Authority Registration**

    This is not regulated by anyone as of now. I am looking to add the authority account as a first user to the system.

- **Verification of Registration and Ownership Transfer**

    In this process, the KCI authority verifies and approves the registration of dog owners, veterinary doctors, and puppys, and also verifies the ownership transfer of each dogs. When the registration process or ownership transfer process is done, that data is stored in a temporary database. Only after the process is verified by the authority, that data is stored in the blockchain.
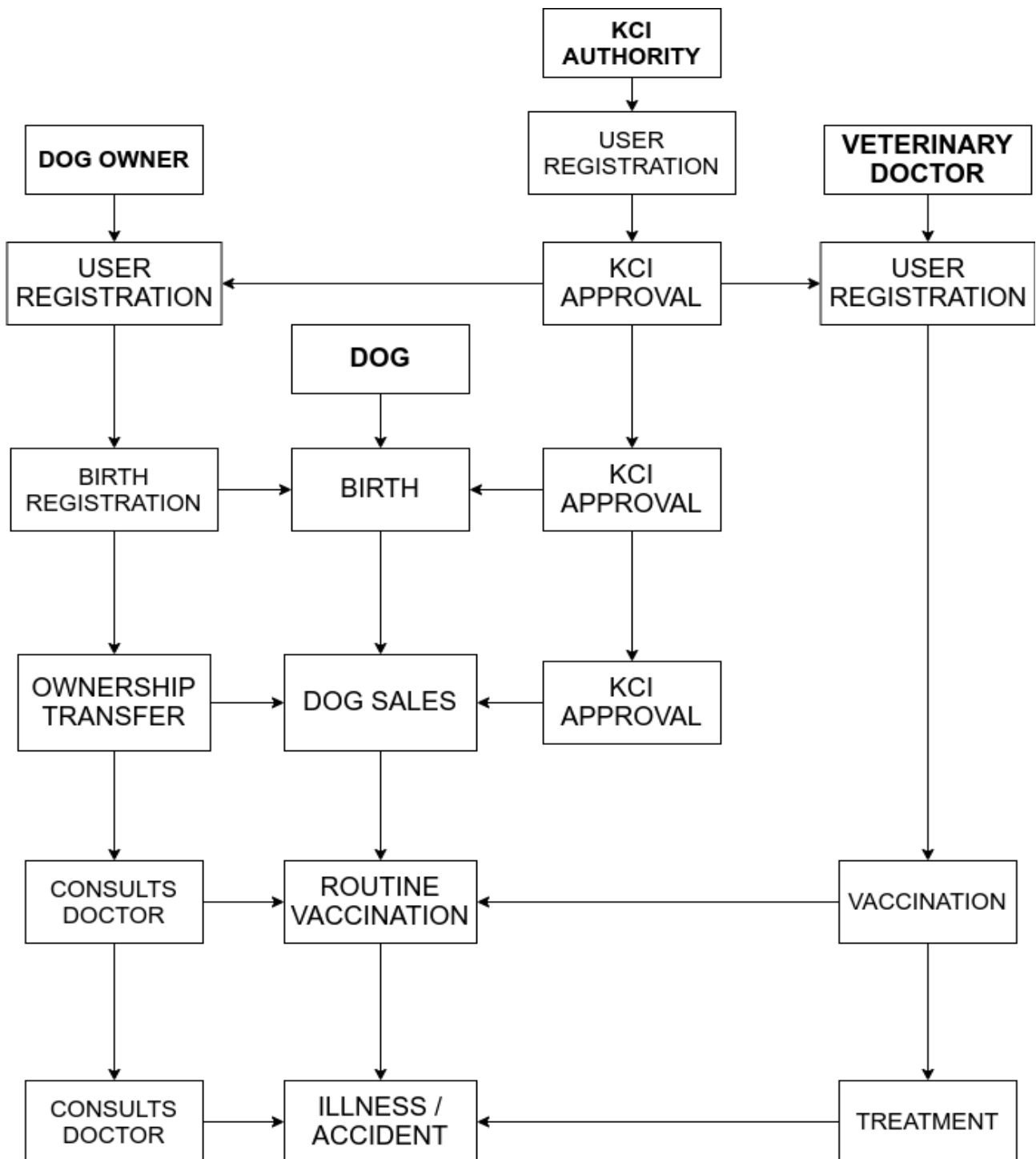
Flow Diagrams

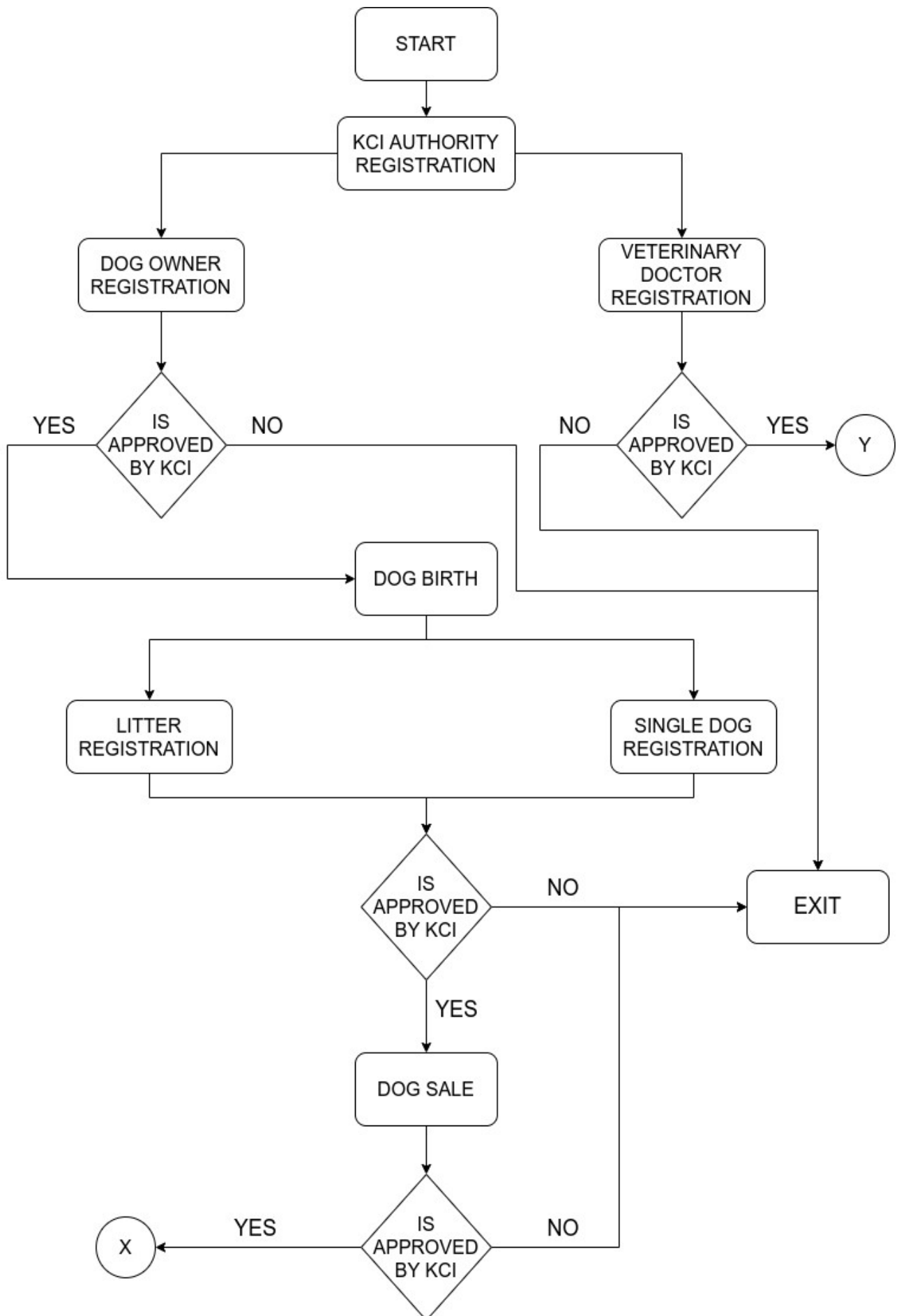FIG : Work flow diagram for dogchain project
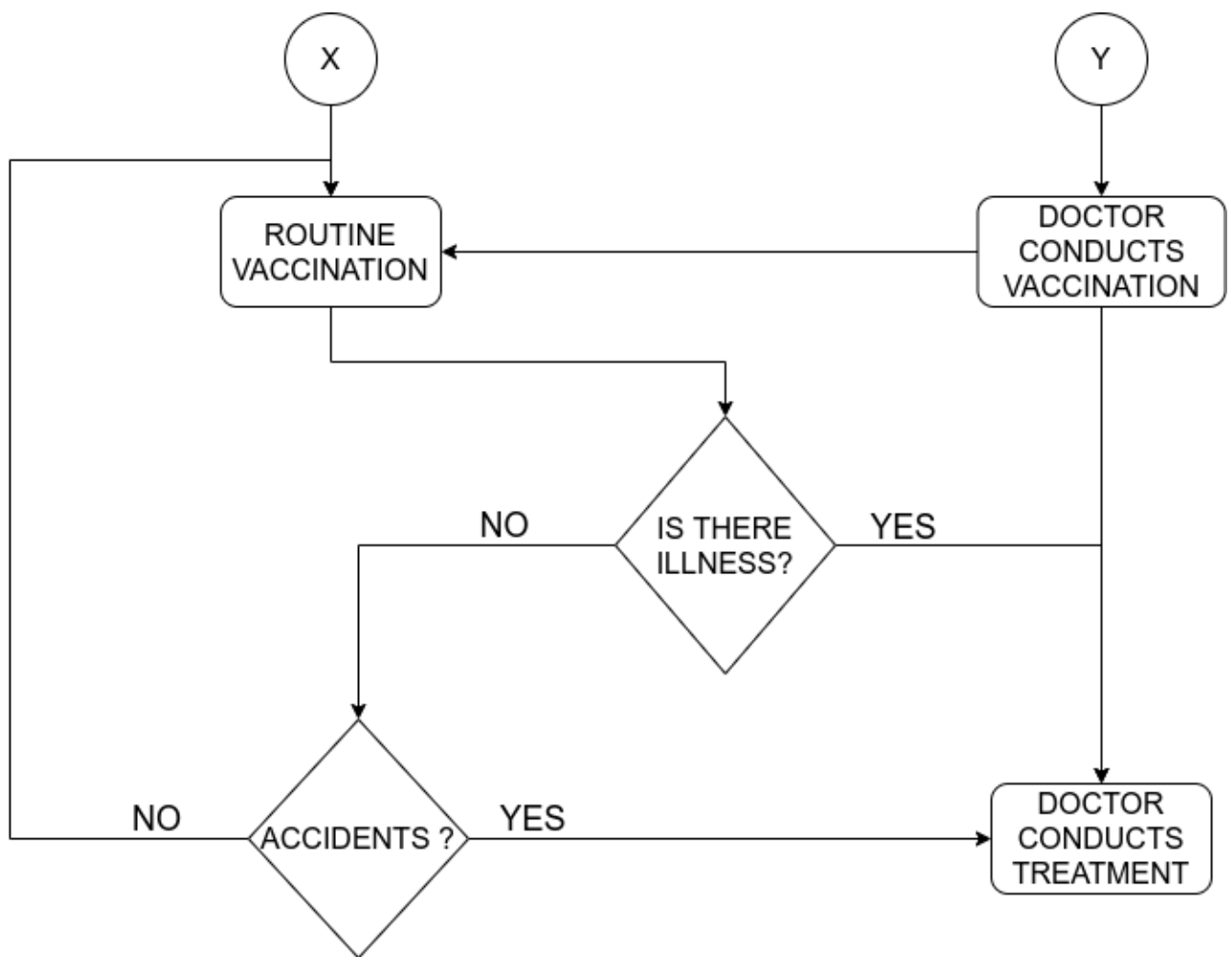
FIG : Process flow diagram part 1 of the dog chain project

FIG : Process flow diagram part 2 of the dog chain project