

# Symptom-Driven Predictive Diagnosis and Treatment of Cattle Health Issues

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**Abstract--** Analyzing data on cattle diseases and processing it to obtain relevant information. Data mining and analysis are being employed in animal husbandry more and more due to the big data and artificial intelligence fields rapid development. This system collects data from numerous sources for electronic medical records on cattle, and it uses data mining and analytical technologies to create an intelligent system for diagnosing diseases in cattle. Initially, stop words, word segmentation, and repetition in the cattle electronic medical record data are eliminated using text preprocessing technology. The corresponding treatment plan will be determined by correlating the specific disease name and probability using various unsupervised learning algorithms, in addition to efficiently reducing herder losses and promoting the advancement of scientific intelligence in animal husbandry, the system can promptly treat illnesses. To process the datasets on cattle diseases and extract relevant medical patterns and information, machine learning methods are employed. We can create a real-time program based on this notion that will help veterinarians treat cattle illnesses more effectively. Through the application of data science approaches, the system determines the relationship between the symptoms, types and treatments of cattle diseases. We employ to create a browser-based application that is suitable for many browser versions and types, specifically for the medical field. To avoid all of these issues, a system that automatically ascertains the links between illnesses, symptoms, and therapies is needed to find the patterns. This improves the efficacy of the method for determining patterns of sickness in cattle.

**Keywords—** Cattle disease, Unsupervised learning, Machine Learning, Data Science, Eclat, SFIT, Apriori TID, Symptoms, Treatments.

## I. INTRODUCTION

Typically found in isolated locations with comparatively low illness conditions animals can be quickly and precisely diagnosed. To prevent the illness from spreading among the cattle, it is essential to identify the disease's consequence and take preventative action. A mechanism is required to help inform livestock owners about the diseases that are affecting their animals, encourage them to take the appropriate precautions, and inform them that diseases can also be the cause of an animal's mortality. The current approach predicts animal illness outbreaks based on certain conditions and takes into account the animal in question as well as the disease. Many times, owners are ignorant of when to take measures and if the illness is benign or could be dangerous[1].

For numerous Indian households, livestock provides an additional revenue stream. One important obstacle preventing the sector from expanding at the targeted rates is the frequency and presence of illness outbreaks. This livestock ailment poses a serious hazard to the health of both animals and humans who interact closely with animals or consume animal products infected by particular diseases. Most animals raised for food are kept in remote areas with little access to medical care[2]. In other countries, medical diagnosis by artificial intelligence has been used for quite some time. As an example, the MYCIN expert system is one of these more complex scenarios. The method uses text classification technologies to first classify the disease's symptoms. The functioning of the auxiliary diagnosis and treatment system depends on text classification. The quality of the

classification findings directly affects the system effect. Thus, the primary objective of this system is to use data analysis from a large number of electronic medical records to classify texts using the classifier algorithm of machine learning. The data science association algorithm is then used to correlate the cattle's status and offer prompt diagnostic and treatment recommendations based on the cattle's symptoms[3][4].

The system effect is directly impacted by the categorization results' level of detail. The main goal of this system is to categorize texts using a huge number of electronic medical records' data analysis and machine learning techniques, specifically the classifier method. After that, link the cattle's symptoms with information gathered through the science association method to quickly provide a diagnosis and treatment plan. Assessing the relationship between the symptoms and the disease itself of cow sickness is one of the trickiest tasks in the modern medical industry. Since there is now no automation to determine the relationship between anomalies and cattle diseases, we need a system that automatically establishes the correlations between symptoms, diseases, and treatments. In the modern world, manual diagnostics is crucial and medical technology is needed to identify cattle sickness. To circumvent all of these issues, we need an automated to recognize the patterns. This improves the efficacy of the method for determining patterns of sickness in cattle.

## II. RELATED WORK

Most animals kept as livestock live in remote areas with limited access to healthcare. In general, it is difficult to diagnose diseases accurately and quickly. Livestock diseases can pose a threat to public health and have a substantial negative effect on the economy since we depend so much on the essential resources that animals supply. Support Vector Classifier (SVC) is used to determine the disease's outcome in order to stop the animals from contracting the illness. This means that a system that enables the taking of precautionary actions concerning the anticipated illness is needed [5]. For the agricultural sector to remain viable and profitable, the wellbeing and health of its cattle are crucial. Preventing epidemics and preserving herd productivity require effective methods for tracking and reporting each cow's health. Utilized is the Random Forest Classifier (RFC) [6]. The goal of the research is to create a model using ML for milk cow health classification. A selection of

non-industrialized nations, such as Bangladesh, Nepal, India, and many more, include dairy farming among their first industries. Dairy farms have become significantly more automated, which has led to a notable rise in productivity. Cattle can suffer from many diseases, some of which can lower production and lower the quality of milk and other dairy goods [7]. The national economy's ability to develop sustainably is seriously hampered by the possibility of these diseases contributing to livestock mortality if found later in life. With the use of data mining and IOT, cattle diseases can be diagnosed.[8]. Cattle can contract FMD, a highly contagious and occasionally fatal viral disease. Blisters that could burst and cause lameness form within the mouth and around the hoof during a period of high fever brought on by the virus [9][10]. The disease is very contagious and can transfer from sick animals to humans through easy touch with contaminated cars, clothing, feed, and farming equipment, which is how IOT technology includes waterproof warmth oversees and pH sensors. FMD and Swollen Skin Disease (LSD) have a significant negative influence on animal-based agriculture.[11]. The prevalent viral disease in cattle is lumpy skin disease. Animals used to suffer from a variety of diseases. The most crucial element in this type of illness is its identification and diagnosis. Algorithms that use machine learning such as Decision Tree (DT) and Support Vector Machine (SVM) are used to detect lumpy skin diseases. The illness frequently causes infertility, decreased milk production, stunted growth, or perhaps even animal death. The Neethling virus is the source of Hallucinogen in cattle. Saliva, big skin nodules, and fever are signs of LSD.[12][13]

## III. METHODOLOGY

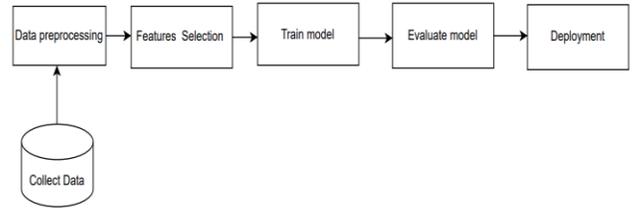
### Dataset

It is the largest publicly accessible dataset and is regarded as an important baseline study. The process of processing data starts with this. In this case, the training datasets are gathered from various websites, including [www.kaagle.com](http://www.kaagle.com). [14]. Data is essentially presented in text format. information gathered and combined from several sources. training datasets kept in Excel spreadsheets. Although all relevant information is contained in training datasets, we still need to retrieve the specific data needed for processing. Data is retrieved and fed into algorithms, which include information on cattle illness categories, symptoms, and treatment specifics.

**Table 1: Details of Dataset**

Dataset Name	Animal Disease Classification
Name	Cattle disease prediction
Disease Description	Describe the symptoms of the cattle disease
Animal Type	Category of Animal is Cattle

While IOT devices and sensors have been utilized in the past to identify symptoms and predict disease, the suggested method only uses software and has no sensors. In the earlier research, supervised learning algorithms were only used to classify, or forecast diseases. However, in the suggested approach, we make use of unsupervised learning algorithms to forecast the relationship between symptoms, illnesses, and therapies. Instead of only identifying the cattle disease, our suggested method also identifies the connections between disease types, symptoms, and therapies. The suggested system also makes use of NLP technology, allowing users to type in symptoms in a text field, which the system then analyses, interprets, and suggests therapies for. While this notion hasn't been applied in real time in any of the previous works, we've developed one here that will be helpful to veterinary professionals in real time. We develop an online, real-time application that runs in a browser and all set libraries have been utilized in previous studies to predict cow diseases. The findings of this study will assist veterinary physicians in determining the correlation between various medications, ailments in cattle and associated symptoms. Veterinarians will benefit from knowing the adverse effects of various medications so they can recommend safer medications to other patients with related diseases in cattle. Pharmaceutical firms will gain as well because we have suggested the most well-liked medicine linkages. Quicker decision-making. Lowers the incidence of cattle illness in accordance with our system's findings.



**Figure : Methodology diagram**

The processing data starts with collecting the data. The datasets are gathered here from many sources. totally dataset is collected is essentially presented in text format, information gathered and combined from several sources. In this step of the data processing procedure, we retrieve data from Excel sheets. Training datasets provide all pertinent data; however, we retrieve the specific data needed for processing based on our requirements. Data that includes the types of cattle diseases, symptoms and their treatments are retrieved and fed into algorithms. Data prior to processing techniques are used to remove unnecessary information from cattle training datasets and fill in any gaps. The necessary formats are created from cleaned training datasets. Certain data science methods require data to be turned into strings because they accept data in strings. This is known as data preparation and select the features which is input into the algorithm to create the model. After the data has been processed and the model has been constructed. The model is examined using ML algorithms and determine the accuracy and efficiency of the methods. The process of evaluating a model involves using indicators to examine the model's performance. To determine the algorithm's correctness and efficiency in the training datasets. The algorithm's execution time and accuracy computed. When the model is constructed and evaluated, the system creates patterns pertaining to the types, symptoms and treatments of cattle diseases, making us prepared for usage. The use of the application is referred to as deployment.

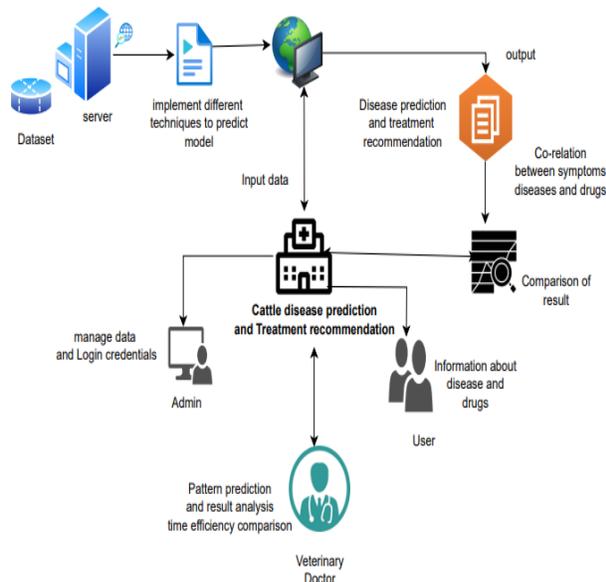


Figure 2: Architecture Diagram

In the Figure shows the focus of architecture is on viewing a system as a Grouping together of various parts and how they work together to achieve the intended outcome. Finding the parts or subsystems and their connections is the main goal and emphasis is on the essential elements.

#### IV. MACHINE LEARNING MODELS

Managing the symptoms and varieties of cow diseases in real time might be difficult because animals are unable to express their distress or concerns. In the medical field, diagnosing the signs of cattle diseases can be challenging. The major objective of the suggested method is to identify the symptoms of cattle diseases and then predict the association between diseases, symptoms, and therapies. It is difficult to identify cattle illnesses and to give the right medications, much like the current method. The recommended strategy forecasts trends and uses data science techniques to identify cattle illness symptoms. The disease identification algorithm based on a LESK. The suggested system looks for patterns employing the ECLAT Algorithm, SFIT Algorithm and Apriori TID. With the aid of this real-time program meant for development, doctors can treat ailments in cattle. the data is processed, a model is constructed using

machine learning algorithms. The model is then tested to determine the methods' correctness and efficiency. training datasets are split into training and testing groups to determine the algorithm's correctness, and execution time is computed to determine its efficiency. When the model is constructed and evaluated, the system creates patterns pertaining to the types, symptoms, and treatments of cattle diseases, making us prepared for usage. The use of the application is referred to as deployment.

Table 2: Comparison results of Time efficiency

Constraint	Apriori Tid	SFIT	ECLAT
Time	814 milli secs	418 milli secs	215 milli secs

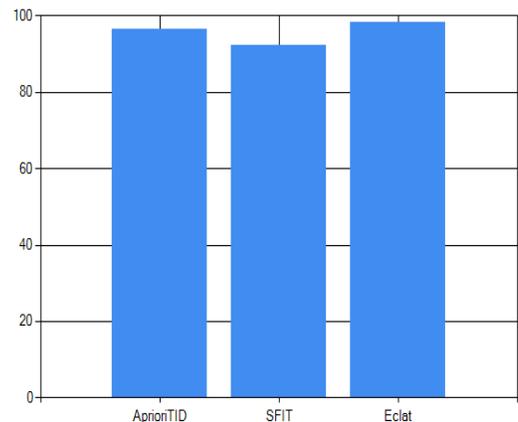
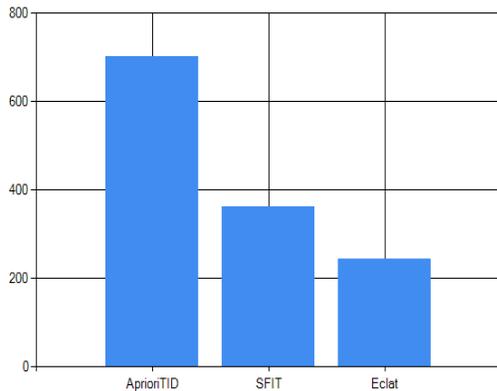


Figure 3: Comparison of Time efficiency of the different methods used

Table 3: Comparison results of Time efficiency

Constraint	Apriori Tid	SFIT	ECLAT
Accuracy	96.45%	92.15%	98.25%



**Table 2: Comparison results of accuracy**

### V. CONCLUSION

In Real time animals cannot express their worries or discomfort, managing cattle illnesses can be difficult. In the medical field, diagnosing cow diseases can be challenging. This system first recognizes the symptoms of cattle diseases and then predicts the correlation between symptoms, diseases, and treatments. Under the current system, it is difficult to diagnose diseases in cattle and to provide the necessary treatments. system that helps veterinary doctors diagnose diseases in cows and the symptoms that go along with them so they may treat cattle more effectively is helpful to the medical industry.

### VI. FUTURE ENHANCEMENTS

Additional training datasets can be used to find more comparable patterns. There are numerous algorithms available for locating the signs, illness and therapies of diseases that affect cattle. To determine which algorithm yields the best results, the several algorithms can also be compared. Image processing techniques could be used to improve the ability to Predict issues affecting cattle.

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