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COW HEALTH MONITORING SYSTEM USING AI

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ABSTRACT

We are introducing an innovative and straightforward solution for placement activities through the development of software designed to manage these activities with an intuitive graphical user interface (GUI). The aim of this project is to create a system tailored for the placement cells of educational institutions. This system will facilitate various placement-related functions, such as sharing student and company information and providing a communication interface between students and the Training and Placement Officer (TPO). The software will be built on a fully modular architecture, enabling the future addition or replacement of modules to enhance specific features as needed. This application will assist the TPO in overseeing student information related to training and placement. Currently, several modules have been implemented to manage training and placement data. Additionally, modules for handling student information, company details, and study materials necessary for company placements are essential. The system will generate a list of students based on requests from company HR managers, provide shortlisted candidates along with their resumes, export data of selected students according to search criteria, manage student profiles, and set eligibility preferences for placements. It will also ensure time and role-based secure access for users. Prior to campus visits, companies will have access to information about eligible and interested students.

Keywords: Cow Health Monitoring, K- Nearest Neighbor Classification, Decision Making, Cattle Disease.

I. INTRODUCTION

Wireless Sensor Networks (WSNs) have advanced in the healthcare sector through the use of low-power wireless technologies and medical sensors, which are considered more advanced and advantageous compared to traditional systems. This advancement is attributed to the reduced energy consumption associated with data transmission among nodes in a mesh-based network architecture. The demand for dairy products is experiencing rapid growth due to significant population increases, prompting enhanced collaboration between the dairy industry and academic institutions to meet the United Nations' Sustainable Development Goals (SDGs). This research is particularly relevant to the 'Zero Hunger' initiative (SDG 2), as it aims to monitor cow health and predict diseases to prevent their transmission among livestock. The objective of this study is to produce healthier meat and dairy products, thereby addressing the global issue of food insecurity. Furthermore, this integration will help mitigate the risk of land species extinction and promote healthy ecosystems, in line with 'Life on Land' (UN's SDG 15). Livestock farming plays a crucial role in improving the livelihoods of individuals in developing countries like India, as it enhances their standard of living and facilitates the monitoring of cattle health data for financial advancement. In 2019, India produced 47 million tons of milk, ranking third globally; however, farmers in India encounter significant financial challenges due to inadequate technology and the impacts of climate change. Recently, these factors have severely affected the production of dairy products and healthy meat, ultimately harming the economic conditions of agriculture-dependent nations like India. WSNs will enable farmers to implement informed and precise measures. Therefore, it is essential for the livestock farming sector to adopt the latest technologies for monitoring and managing livestock herds. Scientific advancements in farming must be utilized to continuously track cattle health data, thereby reducing production costs and combating diseases. This research presents a wireless system for monitoring cattle health that employs cutting-edge technologies to continuously track health data, utilize artificial neural networks for early disease prediction, and protect the wireless sensor network (WSN) from intrusions to prevent data loss. The proposed solution will incorporate a robust authentication mechanism to ensure that only verified nodes transmit data to the base station, thereby maintaining the integrity and secure transmission of sensor data. By applying artificial neural networks to real-time data, we can effectively forecast potential diseases. Additionally, this information will be accessible through a web-based application, allowing authorized users to observe cattle behavior. Access to this data will be restricted to authenticated users only.

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II. METHODOLOGY

Problem Statement

To create an advanced and secure cattle health monitoring system utilizing Wireless Sensor Networks (WSNs), we will develop a framework that includes wearable sensor nodes affixed to the cattle. These nodes will continuously track vital physiological metrics such as rumination, heart rate, and body temperature. The data collected will be transmitted wirelessly to a central server through energy-efficient communication protocols. We will employ Artificial Neural Networks (ANNs) to process real-time data, which will aid in the early detection of diseases. To safeguard the system from unauthorized access, a secure authentication mechanism will be incorporated, ensuring that only authorized nodes can send data. Additionally, a web-based application will be created to enable authenticated users to view real-time health information and receive alerts, thereby promoting proactive health management. Comprehensive field trials will be carried out to assess the system's accuracy and enhance its performance for both reliability and scalability.

Motivation

- Simplified Process Management.
- Improved Employer Relationships.
- Accessible and Efficient Communication.

III. MODELING AND ANALYSIS

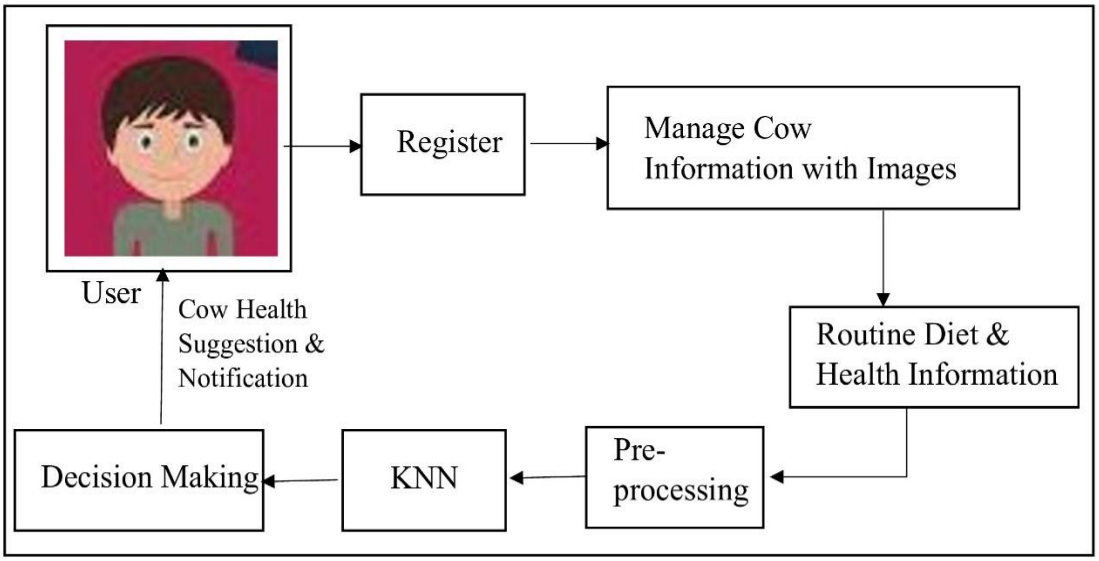

Figure 1: System Overview Design

The cow health monitoring system that utilizes IoT and AI comprises multiple interconnected modules designed to assess cow well-being and optimize feed formulation. Module A: The user registration component of the Cow Health Monitoring System (CHMS) acts as a secure entry point for authorized individuals to access the platform efficiently. It allows new users, including farm managers and veterinarians, to establish accounts by submitting necessary details such as their name, email address, phone number, and designated role. To enhance security, this module implements authentication methods like multi-factor authentication (MFA), which integrates passwords with additional verification steps such as one-time passwords (OTPs) or biometric data. Furthermore, it features role-based access control, which allocates specific permissions according to the user's role, thereby protecting sensitive information related to livestock.

Module B: The cow details module in a Cow Health Monitoring System (CHMS) is designed to manage and organize detailed information about individual cows within a herd. This module records essential data such as the cow's unique identification number, breed, age, weight, and health history. It also tracks dynamic parameters like daily activity levels, feeding habits, milk production, and vital health metrics obtained from IoT sensors, including temperature and heart rate.

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The module enables farmers and veterinarians to monitor each animal's status in real-time, helping to identify abnormalities or trends indicative of health issues. Advanced features may include integration with disease prediction models, enabling the system to correlate data and flag potential health risks early. This information is securely stored in a centralized database, accessible to authorized users based on role-based permissions

Module C: The routine diet and health parameters module in a Cow Health Monitoring System (CHMS) plays a vital role in maintaining the overall well-being and productivity of livestock. This module tracks and manages critical health and nutritional data for each cow, including daily feed intake, water consumption, and essential dietary supplements. By analyzing these inputs, the system ensures that cows receive balanced nutrition tailored to their age, breed, lactation stage, and overall health requirements. In addition to dietary information, this module monitors key health parameters such as body temperature, heart rate, rumination, and movement patterns through non-invasive IoT sensors. These metrics are used to detect early signs of health issues, such as fever, stress, or digestive disorders, allowing for prompt intervention. The system can also integrate with predictive analytics models to identify potential diseases or deficiencies based on deviations in these parameters.

IV. RESULTS AND DISCUSSION

We have successfully developed a cow health monitoring system and disease detection System.

Dear Farmer

The uploaded Image belong to the Pneumonia_Disease Disease

Following is the Treatment of the Disease :

- Pneumonia Disease:

Pneumonia in cows is treated with antibiotics, anti-inflammatory drugs, and vitamin C. It's important to treat suspected cases early.

- Antibiotics:

Florfenicol: Effective against the bacteria that cause pneumonia in dairy cattle

Tildipirosin: Effective against the bacteria that cause pneumonia in dairy cattle

Tulathromycin: Effective against the bacteria that cause pneumonia in dairy cattle

Ceftiofur sodium: Used to treat aspiration pneumonia in cows

- Anti-inflammatory drugs:

Banamine (flunixin meglumine): Controls inflammation and fever

Ketoprofen: Used to treat pneumonia in cows

Meloxicam: Used to treat pneumonia in cows

Tolfenamic acid: Used to treat pneumonia in cows

- Vitamin C:

Injectable vitamin C can improve a cow's response to treatment

Other treatments Isolate affected cows in a well-ventilated area, Maintain hydration, Offer good quality cereal hay or roughly chopped chaff, and Nebulization with ceftiofur and levosalbutamol.

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. And also attached sent Image for your reference.

. And also nearest clinic details and direction

Dr. K Chandvania(MBBS)

Gat No. 648/2, Kesnand Phata, Nagar Rd,

Wagholi, Pune, Maharashtra 412207

- https://www.google.com/maps/dir/18.58266062490349,73.98944615089884

Regards -

Cow Health Monitoring System

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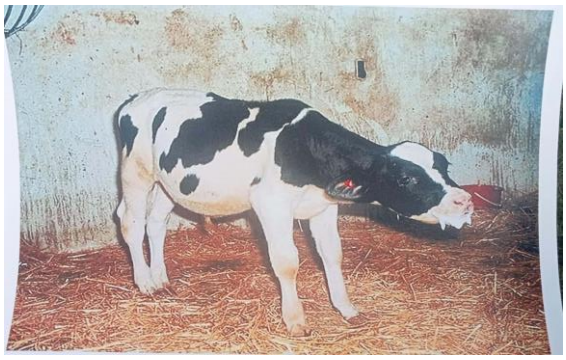

Figure 2: Final Output

V. CONCLUSION

The landscape of agriculture is evolving through the implementation of Wireless Sensor Networks (WSN). We develop and deploy a Cow Health Monitoring System (CHMS) aimed at enhancing animal well-being and reducing food scarcity. Ensuring the health of source animals is crucial for the production and consumption of meat and dairy products. Large-scale livestock healthcare leverages portable WSNs to oversee the health of cows. The integration of Artificial Intelligence (AI) and the Internet of Things (IoT) facilitates the prediction of animal diseases. A web application provides real-time health data for cows, utilizing non-invasive methods and K-Nearest Neighbors (KNN) algorithms for authorized personnel. It incorporates standard authentication protocols and requires robust network security measures to safeguard the confidentiality, integrity, and availability of its resources. This advanced approach to cow health monitoring offers enhanced accuracy.

VI. REFERENCES

[1] K. K. Çevik, "Deep Learning Based Real-Time Body Condition Score Classification System," in IEEE Access, vol. 8, pp. 213950-213957, 2020, doi: 10.1109/ACCESS.2020.3040805.

[2] Ayesha Taranum, Meghana Jayaram, Harini J, Maria Christel, Sonika K C," Surveillance of Cattle Health Monitoring Using Iot with Real Time Dataset", 2020 JETIR July 2020.

[3] J. Bartels et al., "TinyCowNet: Memory- and Power-Minimized RNNs Implementable on Tiny Edge Devices for Lifelong Cow Behavior Distribution Estimation," in IEEE Access, vol. 10, pp. 32706-32727, 2022, doi: 10.1109/ACCESS.2022.3156278.

[4] 4] Shabani, I.; Biba, T.; Çiço, B. Design of a Cattle-Health-Monitoring System Using Microservices and IoT Devices. Computers 2022, 11, 79. https://doi.org/10.3390/ computers11050079.

[5] Karthik Darvesh, Nikhil Khande, Sanmay Avhad and Maahi Khemchandani," IOT and AI Based Smart Cattle Health Monitoring", Volume 14:5, 2023.

[6] K. Darvesh*, N. Khande, S. Avhad, M. Khemchandani," IOT and AI based smart cattle health monitoring", Darvesh et al 2023/ J. Livestock Sci. 14: 211-218.

[7] Jehangir Arshada, Talha Ahmad Siddiquia, M. Ismail Sheikha, M. Sadeed Waseema, M. Abu Bakar Nawaza, Elsayed Tag Eldinb, Ateeq Ur Rehman," Deployment of an intelligent and secure cattle health monitoring system", Received 1 August 2022 Revised 22 March 2023 Accepted 2 April 2023 Available online 8 April 2023.

[8] Bhatla AB, Kikani YB, Joshi DG1, Jain and Patel," Real Time Cattle Health Monitoring Using IoT, ThingSpeak, and a Mobile Application", August 22, 2023 DOI: 10.23880/jeasc-16000131.

[9] Mr. Jayesh Surana, Dr. Sanjay Kumar Sharma," Predicting Cow Health with a Smart Framework: A Big Data and Deep Learning-Based IoT Approach", ISSN:2147-67992 Accepted: 08/01/2024.

[10] Pawitar Dulari, Ajay Bhushan, Brijender Bhushan," IoT-Based Buffalo Health Monitoring System", ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538 Volume 11 Issue XI Nov 202