

ARTIFICIAL INTELLIGENCE TO INDICATE THE CATTLE HEALTH

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ABSTRACT

The dairy sector is one of the fast growing sectors in the Indian rural economy that not only provides employment to 80 million of rural households but also contributes to the 5.2% GVA (NDDB, 2020). The steady growth in dairy sector in India is facing many challenges. Major problems faced by the livestock farmers are non-availability of round the clock extension advisory services, doorstep veterinary services and inability to identify the problems at the right time and lack of knowledge on preventive & primary care. “Dvara Surabhi” app is a unique app which indicates the cattle health status (as an indicator) at a given time and help farmer take suitable actions. The solution leverages deep learning and artificial intelligence models and advanced veterinary science concepts and practices. It has been widely used across many states in India. It has been helping thousands of small dairy farmers to know the health status of their cattle (as an indicator) with a single click of a picture in less than a minute. This article talks about the Dvara Surabhi App and its use case among dairy farmers in India.

Keywords: *Artificial Intelligence, mobile application, Cattle health, Dvara Surabhi, Do It Yourself, Dairy Farming*

INTRODUCTION:

Dairy industry is one of the fast growing single-largest Agriculture allied sector in India. It contributes 5.2 per cent to the national economy and employing 80 million farmers directly. Dairy farming provides livelihood to 2/3rd of rural community. India’s cattle inventory amounted to over 30 crores as per the 2019 Livestock Census. According to National Commission on Agriculture (NCA), the norm is to have at least one veterinary doctor for every 5,000 cattle unit. On the other side, lacking access to veterinarians by farmers led to failure in monitoring health status of cattle, feeding mismanagement, increase in feeding and treatment cost of the cattle which affects the livelihood of small and

marginal farmers. Farmer needs scientific, accurate first-hand information to change their level of awareness, approach and the practice, to improve the current cattle management.

OBJECTIVES:

Our objective is to empower the dairy farmers to identify the cattle health (as an indicator) in a single click of a picture with minimal information through Do It Yourself (DIY) approach. This helps farmers to take suitable decisions/interventions. The unique mobile application “Dvara Surabhi” is aimed to help the farmers to get the following benefits;

- Health status (as an indicator) based on the current stage of the cattle
- Check the health status while buying and selling cattle
- Nutritional status of cattle
- Possible problems which can occur to the cattle
- Helps the farmers to take a better decision on how to prevent the problems

METHODOLOGY:

“Dvara Surabhi” was created based on Veterinary science concepts and leveraging new age technology (machine learning, deep learning models). It is an interdisciplinary innovative approach to help the dairy farmers. The idea behind the app is to detect the cattle health in the same manner how a veterinarian detects predicts the cattle health when he/she sees the cattle externally with minimal information. The mobile app is available in Google play store. Post installation of the mobile application, the user needs to enter the basic cattle details such as cattle type, cattle stage, days since last calving, and Pregnancy status.

They need to take a picture of back side of the cattle. The inhouse developed technology tool Intelligent Surabhi Analysis (ISA) identifies the back of the animals and shows green box for the correct image. The non- back images are shown as “non-back” The filtering of good images is done at this level and the image captured is correlated with the details entered by the farmer in app. After the image capture the user is given a chance to compare the image taken is right or wrong. He can recapture the image if it not like ideal image provided for reference. The instant indications flash immediately after the user submits the picture. The indications are cattle specific, based on specific information provided by the user and the back image.

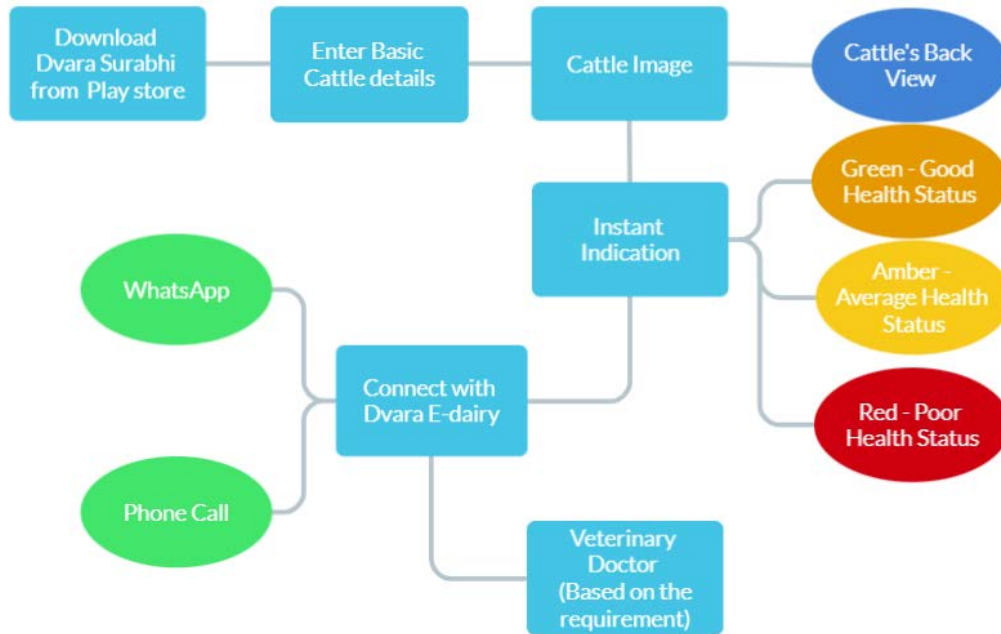


Fig. 1: Workflow of “Dvara Surabhi”

The indications are provided in three different colours which indicates the cattle health status as following

- Green – Good Health Status
- Amber – Average Health Status
- Red – Poor Health Status

If the farmer wishes to contact veterinarians, they can post their questions through the mobile app or directly chat with the veterinarians via the WhatsApp link provided in app. The farmer can also call the customer care support to get their doubts cleared.

RESULTS AND DISCUSSION

The app is widely used by the dairy farmers in many states across India. The app is available in eight regional languages covering the major dairy focussed states in India. The app has been downloaded by 250 k plus dairy farmers. The average daily app usage is approximately 500 to 1000 plus farmers

Few testimonials from the Farmers are as follows;

1. Seeing is believing: I had purchased the cow recently and used Dvara Surabhi app to check the health status. Dvara Surabhi alerted me on the issues consistently and the cattle had uterine prolapse on the fourth day. The app helped me to return to the seller in the right time.
2. Timely support through digital interactions: After contacting to the veterinarians through app, I could get the remedy for my recently calved cow which was bellowing the whole night.
3. Timely help reduced my treatment cost and prevent the economic loss. The milk is main source of our income. Contacting Veterinarians has secured our livelihood.
4. Diagnosis and accurate results from the application. My cow has not conceived for the past one year. App has indicated it correctly. When we contacted the Veterinarians through app they suggested breeding management tips.

If the farmer wants to know more about cattle health, he/she can connect with Dvara E-dairy through WhatsApp or Phone Call. Based on the query the farmer, we connect to Dvara E Dairy veterinarians to get their doubts cleared.

CONCLUSION

“Dvara Surabhi” is an easy-to-use mobile application (as good a “Digital Veterinarian”) which can indicate the cattle health and help the dairy farmer to take suitable and timely decisions. “Dvara Surabhi” has been helping tens of thousands of small dairy farmers to know the health status of the cattle as a “Do It Yourself” approach within a minute. The solution has been used by veterinary doctors. The solution leverages deep learning and machine learning models and veterinary science concepts. Farmers reach out to Dvara E-dairy through mobile application for further support to manage their cattle scientifically and to improve their livelihood. We have partners across different verticals and in select geographies to help small dairy farmers to participate and progress in the growing dairy economy.

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