

# Application of Internet of Things(IOT) in Cattle Maintenance and Agriculture Farming

<sup>1</sup>I Giri Prasad, <sup>2</sup>V. Deepa, <sup>3</sup>J. Sheik Mohamed,

<sup>1</sup>I MCA, SITAMS, Chittoor, A.P.

<sup>2</sup>II MCA, SITAMS, Chittoor, A.P.

<sup>3</sup>Asst. Professor, MCA Department, SITAMS,, Chittoor, A.P.

**Abstract:** Vision is a boon to human, which makes us to see shapes, colors, textures, identify objects, and focus on what we want to see, analyze and detect or predict any dangers and what not. Everything which happens in human is a biological mechanism which is controlled by our brain. With growing technology, almost every feature of our vision is needed to many machines today. This is the main reason to the computers, machines to mimic the human vision and discover many features that make our life smoother. As human vision is a part of natural intelligence computer vision is a part of Artificial intelligence, which is used for security, decision making, detecting objects, processing images, fraud detection, emotion detection, focus on specific details, capture images and many more.

**Keywords:** Computer Vision (CV), Artificial intelligence (AI).

## I. INTRODUCTION ABOUT IOT

The Internet of things (IoT) is the extension of Internet connectivity into physical devices and everyday objects. Embedded with electronics, Internet connectivity, and other forms of hardware (such as sensors), these devices can communicate and interact with others over the Internet, and they can be remotely monitored and controlled.

The definition of the Internet of things has evolved due to convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems. Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), and others all contribute to enabling the Internet of things. In the consumer market, IoT technology is most synonymous with products pertaining to the concept of the "smart home", covering devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smartphones and smart speakers.

The IoT concept has faced prominent criticism, especially in regards to privacy and security concerns related to these devices and their intention of pervasive presence.

## II. WORKING PRINCIPLES OF INTERNET OF THINGS

The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors, processors and communication hardware. These devices, often called "connected" or "smart" devices, can sometimes talk to other related devices, a process called **machine-to-machine**(M2M) communication, and act on the information they get from one another. Humans can interact with the gadgets to set them up, give them instructions or access the data, but the devices do most of the work on their own without human intervention. Their existence has been made possible by all the tiny mobile components that are available these days, as well as the always-online nature of our home and business networks.

Many of us have dreamed of smart homes where our appliances do our bidding automatically. The alarm sounds and the coffee pot starts brewing the moment you want to start your day. Lights come on as you walk through the house. Some unseen computing device responds to your voice commands to read your schedule and messages to you while you get ready, then turns on the TV news. Your car drives you to work via the least congested route, freeing you up to get caught up on your reading or prep for your morning meeting while in transit.

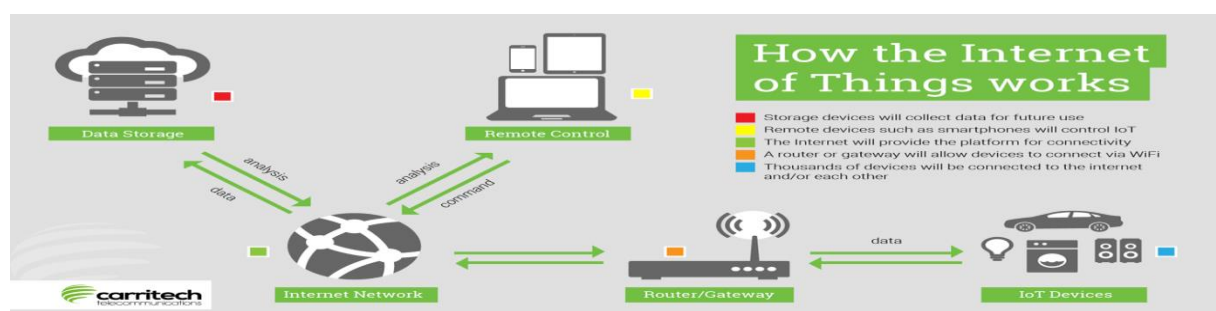


Figure 1:-Working principles of Internet of Things

### 3. APPROACHES OF CATTLE FARMING

#### 3.1 History

In the last century or so larger farms specialising in dairy alone have emerged. Large scale dairy farming is only viable where either a large amount of milk is required for production of more durable dairy products such as cheese, butter, etc. or there is a substantial market of people with cash to buy milk, but no cows of their own.

#### 3.2 Hand milking

Centralized dairy farming as we understand it primarily developed around villages and cities, where residents were unable to have cows of their own due to a lack of grazing land. Near the town, farmers could make some extra money on the side by having additional animals and selling the milk in town. The dairy farmers would fill barrels with milk in the morning and bring it to market on a wagon. Until the late 19th century, the milking of the cow was done by hand. In the United States, several large dairy operations existed in some north-eastern states and in the west, that involved as many as several hundred cows, but an individual milker could not be expected to milk more than a dozen cows a day. Smaller operations predominated. Here we can use the IOT to milking the cows with using various milking Machines present in the market.

#### 3.3 Tracking and Monitoring

- ▶ In olden days, people only monitor the cows with their home cows only.
- ▶ They can monitor only minimum amount of cattle.
- ▶ They can track the cattle's a few and see their health a few times this leads to a bad situation.

There are drawbacks with this process and getting profits very less

### IV. IOT AND CLOUD IN CATTLE FARMING

This allows farmers to monitor cow's health and track their Movements, ensuring a healthier, more plentiful supply of milk. On average, each cow generates about 200MB of information per year.

Large farm owners can utilize wireless IoT applications to collect data regarding the location, well-being, and health of their cattle. This information helps them in identifying animals that are sick so they can be separated from the herd, thereby preventing the spread of disease. It also lowers labour costs as ranchers can locate their cattle with the help of IoT based sensors.

#### 4.1 Process of IOT in cattle Farming

- ▶ The data that are collect in the each cattle that are transferred to store in the cloud.
- ▶ These data is managed and maintained with proper monitoring and tracking.
- ▶ Every cow has different id and it can track easily and maintain some proper care if they are in unhealthy.
- ▶ Apply ear tags to, boluses in your animals
- ▶ Read RFID identification codes to track individual animals
- ▶ Use the included software to integrate data seamlessly to your livestock management system.



Figure 2:

**movement tracking with Mobile APP**

cattle

In the world of IoT, even the cows will be connected and monitored. Sensors are implanted in the ears of cattle.

## 4.2 Cattle Movement

Monitoring cattle movement to combat theft and locating their position was deemed a necessity by dairy farmers. Latest IoT innovations have brought forward a solution. BT, a company in UK, has incorporated a technology that can pinpoint the location of cattle and where are roaming on the go. The technology can work on any connected device, including your mobile, and helps you gauge the location of your cattle on the go.



Figure 3: Movement of cattle in the farmland with tracking sensors

## V. IOT AND CLOUD IN AGRICULTURE FARMING

### 5.1 Monitoring of Climate Conditions

Probably the most popular smart agriculture gadgets are weather stations, combining various smart farming sensors. Located across the field, they collect various data from the environment and send it to the cloud.



Figure 4: Monitoring the drip system and also climatic conditions.

### 5.2 Greenhouse Automation

In addition to sourcing environmental data, weather stations can automatically adjust the conditions to match the given parameters. Specifically, greenhouse automation systems use a similar principle.

GreenIQ is also an interesting product that uses smart agriculture sensors. It is a smart sprinklers controller that allows you to manage your irrigation and lighting systems remotely.

### 5.3 Crop Management

One more type of IoT product in agriculture and another element of precision farming is crop management devices. Just like weather stations, they should be placed in the field to collect data specific to crop farming; from temperature and precipitation to leaf water potential and overall crop health, these can all be used to readily collect data and information for improved farming practices.



Figure 5:-Showing the testing of the soil and the crop.



## 5.4 End-to-End Farm Management Systems: -

A more complex approach to IoT products in agriculture can be represented by the so-called farm productivity management systems. They usually include a number of agriculture's IoT devices and sensors, installed on the premises as well as a powerful dashboard with analytical capabilities and in-built accounting/reporting features.

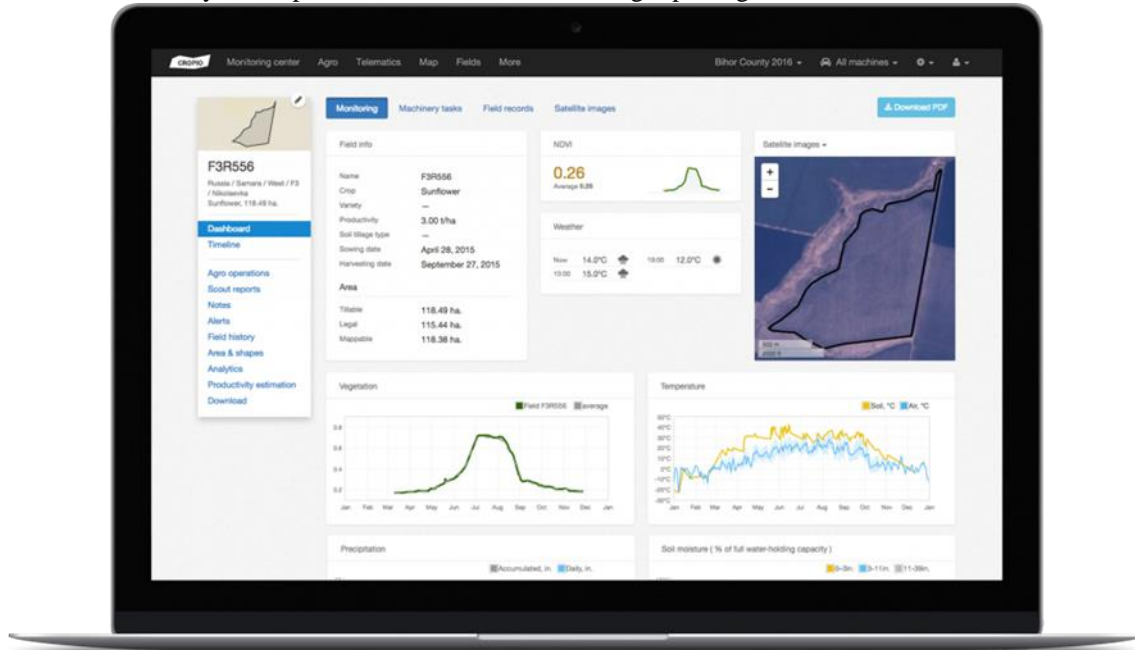


Figure 6:-Full tracking is showing the website.

## CONCLUSION

Thus, the IoT agricultural applications are making it possible for ranchers and farmers to collect meaningful data. Large landowners and small farmers must understand the potential of IoT market for agriculture by installing smart technologies to increase competitiveness and sustainability in their productions. With the population growing rapidly, the demand can be successfully met if the ranchers, as well as small farmers, implement agricultural IoT solutions in a prosperous manner.

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