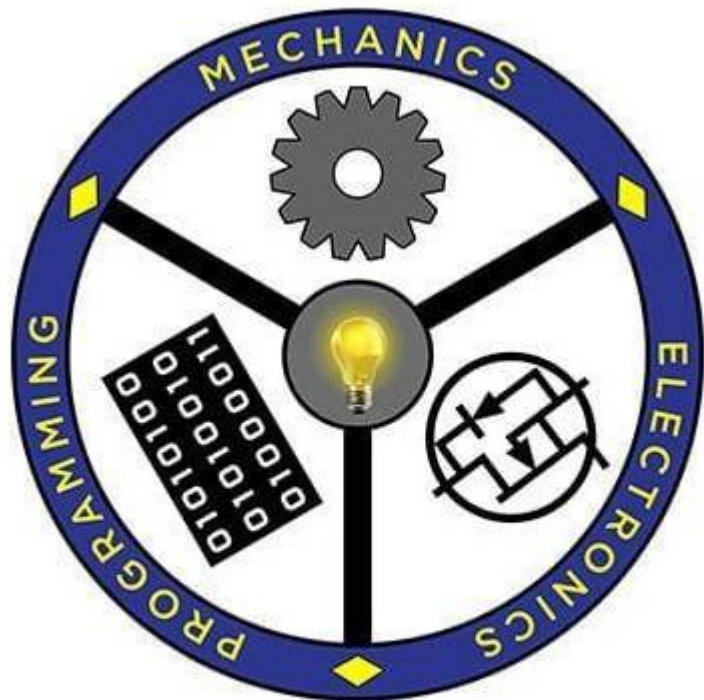


Project Report on
KAMADHENU

Submission to THE ROBOTICS CLUB - SNIST as a part of
POST INDUCTION'22

TEAM NO - 01



THE ROBOTICS CLUB

Integrating Knowledge...

THE ROBOTICS CLUB-SNIST

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY

(AUTONOMOUS)

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2022

CERTIFICATE

This is the project work titled '**KAMADHENU**' by **P.Sudhensh Reddy, Mohammed Sannan Ahmed, K.Deeksha, Malla Venkata Sai Ashish, P.Tejaswini, Syed Omer Faroooq**. This is a record of the project work carried out by them during the year 2022-2023 as part of POST INDUCTION under the guidance and supervision of

Mr. D P Naga Ajay Kumar
&
Ms. P Tapaswini
Technical Heads

Mr. T Bharat Kumar
The President of
THE ROBOTICS CLUB

Dr. A. PURUSHOTHAM
Faculty Advisor
Mechanical Department

DECLARATION

The project work reported in the present thesis titled “KAMADHENU” is a record of work done by Team 01 in **THE ROBOTICS CLUB** as a part of **POST INDUCTION-2022**.

No part of the thesis is copied from books/ journals/ Internet and wherever the portion is taken, the same has been duly referred in the text. The report is based on the project work done entirely by TEAM 01 and not copied from any other source.

ACKNOWLEDGMENT

This project report is the outcome of the efforts of many people who have driven our passion to explore into implementation of **KAMADHENU**. We have received great guidance, encouragement and support from them and have learned a lot because of their willingness to share their knowledge and experience.

We thank our technical heads **Mr. D P Naga Ajay Kumar** and **Ms. P Tapaswini** for being with us till the end of the project completion.

We thank all the members of the **Steering Body, Executive Body, Technical Advisory Board, and Club's Incubation and Competence Committee** of **The Robotics Club** for helping us with crucial parts of the project. We are deeply indebted to **Mr. T Bharat Kumar** - The President, **Mr. N Abinav** - The Vice President, **Mr. Jayanth Siva Madhav** - SAB Chairman and **Mr. S.V. Reddy** - General Secretary **THE ROBOTICS CLUB** respectively and also every other person who spared their valuable time without any hesitation whenever we wanted.

We also thank our faculty advisor **Dr. A. Purushotham**, Professor Mechanical Department, who encouraged us during this project by rendering his help when needed.

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ABSTRACT
THE ROBOTICS CLUB - SNIST
POST INDUCTION'22
TEAM-NO – 01

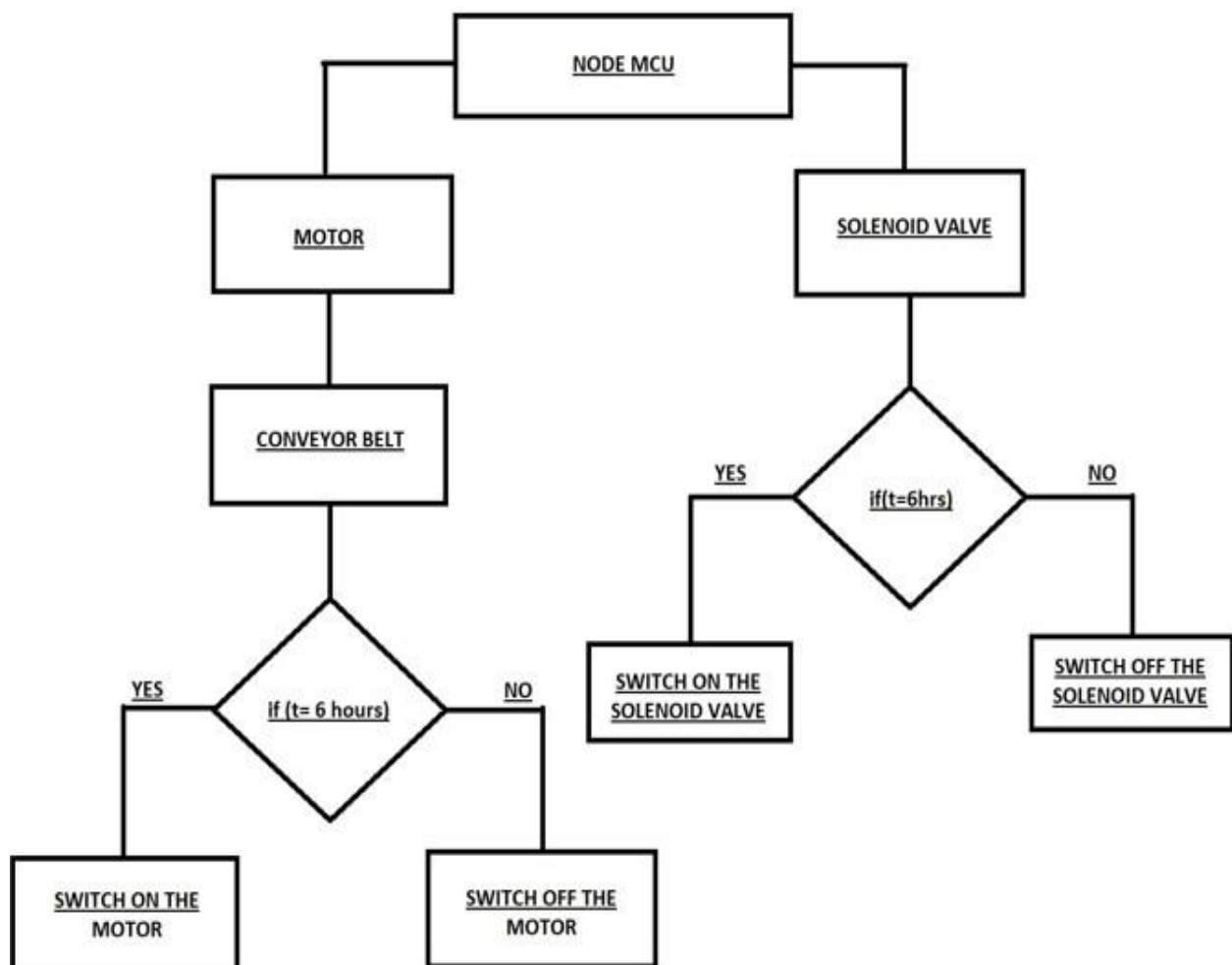
THE PROBLEM:

Cattle perform a major role in helping farmers in agriculture especially in a country like India. Most of the farmers use cattle to plough the land to grow crops. Cattle also give us organic manure to keep the farm land good and fertile for farming. So, protecting cattle is also as equally important as protecting crops. Nowadays, all the living things on earth are subjected towards various diseases and viruses. And statistically most of them are infective and they spread by means of physical contact. One of those viruses is lumpy virus which is affecting cows and buffaloes. If a non-infected cow drinks water from the same source from where infected cattle drinks water the virus spreads. If one such problem is existing right now; we can expect ten more in the future. Hence, to prevent the spreading of these kind of viruses we have come up with an idea called Hay and water dispenser for cattle.

THE TEAMS APPROACH TO THE PROBLEM: -

Our bot consists of two boxes made up of waterproof wood. They will be aligned side by side. One wooden box will be used for storing dispensed hay and one will be used for storing water. The hay we will be using must be rolled up in order to make it easy while releasing it. The bot will be programmed so as to dispense one hay roll and a few litres of water every 6 hours. To dispense the hay roll we will be using a conveyor belt on which a few hay rolls will be placed at uniform distances. And the conveyor belt will be powered using a DC motor. So, every 6 hours the motor will be switched on to push the hay roll into the wooden box. For water we need a water source from where water will be pumped into the water box. A Solenoid valve will be used to let the water into the water box. Every 6 hours the solenoid valve will be switched on till the required amount of water is poured into the box. In this way we can avoid the spreading of viruses and a farmer can save his time and energy too.

BLOCK DIAGRAM:



TITLE OF THE PROJECT: -

KAMADHENU

What do you feel is the most innovative part of the problem?

We feel that the most innovative part our project is that it decreases human labor you can stack our project with hay and water sufficient for 2-3 days and not worry about feeding the cattle and it also reduces the risk of spreading of the viruses like lumpy virus in the cattle by avoiding contact among cattle during feeding them and also by reducing the physical contact of humans it also reduces the risk of spreading diseases which can be caused by contact with the animals.

IEEE FORMAT

Kamadhenu

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Abstract—Cattle perform a major role in helping farmers in agriculture especially in a country like India. Most of the farmers use cattle to plough the land to grow crops. Cattle also give us organic manure to keep the farm land good and fertile for farming. So, protecting cattle is the also as equally important as protecting crops. Nowadays, all the living things on earth are subjected towards various diseases and viruses. And statistically most of them are infective and they spread by means of physical contact. One of those viruses is lumpy virus which is affecting cows and buffaloes. If a non-infected cow drinks water from the same source from where infected cattle drinks water the virus spreads. If one such problem is existing right now; we can expect ten more in the future. Hence, to prevent the spreading of these kind of viruses we have come up with an idea called Hay and water dispenser for cattle

I. INTRODUCTION

As we recently met with an virus on animals names Lumpy virus. Lumpy skin disease (LSD) is an infectious disease in cattle caused by a virus of the family Poxviridae, also known as Neethling virus. The disease is characterized by large fever, enlarged superficial lymph nodes and multiple nodules on the skin and mucous membranes. Infected cattle also may develop edematous swelling in their limbs and exhibit lameness. To over come this and to preventing it from effecting others we are coming up with an solution of a quarantine.

II. PROBLEM STATEMENT

Our bot consists of two boxes made up of waterproof wood. They will be aligned side by side. One wooden box will be used for storing dispensed hay and one will be used for storing water. The hay we will be using must be rolled up in order to make it easy while releasing it. The bot will be programmed so as to dispense one hay roll and a few litres of water every 6 hours. To dispense the hay roll we will be using a conveyor belt on which a few hay rolls will be placed at uniform distances. And the conveyor belt will be powered using a DC motor. So, every 6 hours the motor will be switched on to push the hay roll into the wooden box. For water we need a water source from where water will be pumped into the water box. A Solenoid valve will be used to let the water into the water box. Every 6 hours the solenoid valve will be switched on till the required amount of water is poured into the box. In this way we can avoid the spreading of viruses and a farmer can save his time and energy too.

III. LITERATURE SURVEY

We all discussed about the problem statement and put out our own ideas and changes to bring this small scale project which can be made fast. We saw multiple videos and had many discussions on how to implement our idea in an efficient way and what are the measures we need to take while doing the project.

IV. ARCHITECTURE

A. List Of Figures

1. Node MCU
2. Relay Switches
3. Solenoid Valve
4. DC Motor
5. Jumper Wires
6. Ball Bearings

B. Components Used

1. Node MCU:



Fig. 1. Node MCU ESP8266

NodeMCU is an open-source LUA based firmware developed for the ESP8266 Wi-Fi chip. By exploring functionality with the ESP8266 chip, NodeMCU firmware comes with the ESP8266 Development board/kit i.e., NodeMCU Development board. Since NodeMCU is an open-source platform, its hardware design is open for edit/modify/build. NodeMCU Dev Kit/board consist of ESP8266 Wi-Fi enabled chip. The ESP8266 is a low-cost Wi-fi chip developed by Espressif Systems with TCP/IP protocol. For more information about ESP8266, you can refer to the ESP8266 Wi-fi module. There is Version2 (V2) available for NodeMCU Dev Kit i.e., NodeMCU Development Board v1.0 (Version2), which usually comes in black coloured PCB.

2. Relay Switch:



Fig. 2. Relay Switch

A Relay is a simple electromechanical switch. While we use normal switches to close or open a circuit manually, a Relay is also a switch that connects or disconnects two circuits. But instead of a manual operation, a relay uses an electrical

signal to control an electromagnet, which in turn connects or disconnects another circuit. Generally, two more contacts will be present, called as switching points to connect high ampere load. Another contact called common contact is present in order to connect the switching points. These contacts are named as normally open (NO), normally closed (NC) and common (COM) contacts. We can use a Relay either in an AC circuit or a DC Circuit. In case of AC relays, for every current zero position, the relay coil gets demagnetized and hence there would be a chance of continues breaking of the circuit. So, AC relays are constructed with special mechanism such that continuous magnetism is provided in order to avoid above problem. Such mechanisms include electronic circuit arrangement or shaded coil mechanism.

3. DC Motor:



Fig. 3. Dc Motor

A DC motor or direct current motor is an electrical machine that transforms electrical energy into mechanical energy by creating a magnetic field that is powered by direct current. When a DC motor is powered, a magnetic field is created in its stator. The field attracts and repels magnets on the rotor; this causes the rotor to rotate. To keep the rotor continually rotating, the commutator that is attached to brushes connected to the power source supply current to the motors wire windings. One of the reasons DC motors are preferred over other types of motors is their ability to precision control their speed, which is a necessity for industrial machinery. DC motors are able to immediately start, stop, and reverse—an essential factor for controlling the operation of production equipment.

4. SOLENOID VALVE:



Fig. 4. Solenoid Valve

A solenoid valve is an electrically controlled valve. The valve

features a solenoid, which is an electric coil with a movable ferromagnetic core (plunger) in its centre. In the rest position, the plunger closes off a small orifice. An electric current through the coil creates a magnetic field. The magnetic field exerts an upwards force on the plunger opening the orifice. This is the basic principle that is used to open and close solenoid valves. A solenoid valve consists of two main components: a solenoid and a valve body (G). Figure 2 shows the components. A solenoid has an electromagnetically inductive coil (A) around an iron core at the centre called the plunger (E). At rest, it can be normally open (NO) or normally closed (NC). In the de-energized state, a normally open valve is open and a normally closed valve is closed. When current flows through the solenoid, the coil is energized and creates a magnetic field. This creates a magnetic attraction with the plunger, moving it and overcoming the spring (D) force. If the valve is normally closed, the plunger is lifted so that the seal (F) opens the orifice and allows the flow of the media through the valve. If the valve is normally open, the plunger moves downward so that the seal (F) blocks the orifice and stops the flow of the media through the valve. The shading ring (C) prevents vibration and humming in AC coils.

5. JUMPER WIRES:



Fig. 5. Jumper wires

Generally, jumpers are tiny metal connectors used to close or open a circuit part. They have two or more connection points, which regulate an electrical circuit board. Their function is to configure the settings for computer peripherals, like the motherboard. Suppose your motherboard supported intrusion detection. A jumper can be set to enable or disable it. Jumper wires are electrical wires with connector pins at each end. They are used to connect two points in a circuit without soldering. You can use jumper wires to modify a circuit or diagnose problems in a circuit. Further, they are best used to bypass a part of the circuit that does not contain a resistor and is suspected to be bad. This includes a stretch of wire or a switch. Suppose all the fuses are good and the component is not receiving power; find the circuit switch. Then, bypass the switch with the jumper wire. How much current (I) and voltage (V) can jumper wires handle? The I and V rating will depend on the copper or aluminium content present in the wire. For an Arduino application is no more than 2A and 250V. We also recommend using solid-core wire, ideally 22

American Wire Gauge (AWG). Jumper wires come in three versions: • Male-to-male jumper • Male-to-female jumper • Female-to-female jumper

6. BALL BEARINGS:



Fig. 6. Ball Bearings

Ball bearings are types of rolling-elements bearings that carry loads, reduce friction, and position moving machine parts while facilitating motion. They reduce surface contact and friction across moving planes by using separate two “races,” or bearing rings. Compared to flat surfaces that rub against each other, the coefficient of friction is reduced by the rotating motion of the balls. Ball bearings consist of four major parts which are: 2 rings/races, the balls (the rolling elements), and the retainer (the ball separator). Angular contact ball bearings and radial ball bearings include an inner and outer ring. Angular contact ball bearings and radial ball bearings are designed to support loads that are oriented in a perpendicular direction to the axis of rotation, known as radial loads.

V. SOFTWARE REQUIREMENT

A. *Arduino IDE:*

Arduino “Integrated Development Environment” is an open source Arduino Programming acclimated compose codes in simple way and transfer it to the Board.:

B. *Proteus Software:*

The Proteus Design Suite is a proprietary software tool suite used primarily for electronic design automation. The software is used mainly by electronic design engineers and technicians to create schematics and electronic: prints for manufacturing printed circuit boards.

C. *Auto CAD :*

CAD (computer aided design) design is used in almost every industry, in projects as wide-ranging as landscape design, bridge construction, office building design, and movie animation. With 2D or 3D CAD programs, you can perform a variety of tasks: you can create a 3D model of a design, apply material and light effects, and document the design with dimensions and other annotations. With features like point

clouds, you can add real-life context to your drawings to create a digital twin or recreate physical objects in your designs:

D. Thinker cad :

Tinker cad is a free web app for 3D design, electronics, and coding, trusted by over 50 million people around the world. Build STEM confidence by bringing project-based learning to the classroom.:

VI. IMPLEMENTATION AND WORKING

}

A. Block Diagram

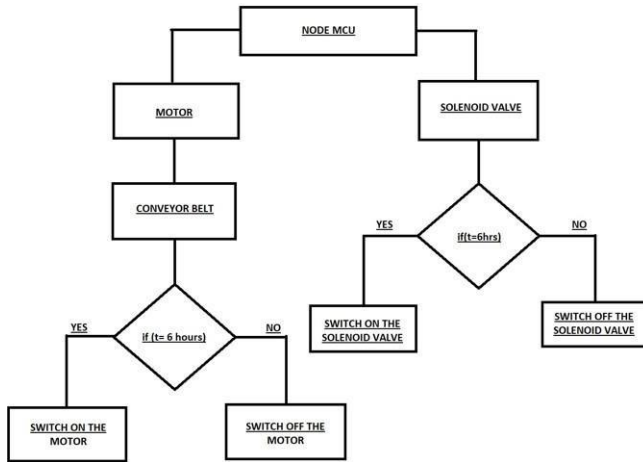


Fig. 7. Block Diagram

B. Circuit Diagram

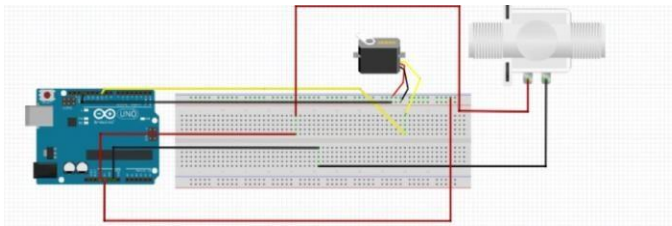


Fig. 8. Circuit Diagram

C. CAD Model

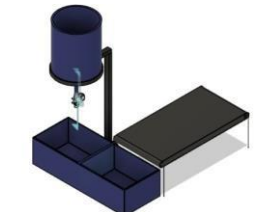


Fig. 9. CAD Model

D. Working

Our bot consists of two boxes made up of waterproof wood. They will be aligned side by side. One wooden box will be used for storing dispensed hay and one will be used for storing water. The hay we will be using must be rolled up in order to make it easy while releasing it. The bot will be programmed so as to dispense one hay roll and a few litres of water every 6 hours. To dispense the hay roll we will be using a conveyor belt on which a few hay rolls will be placed at uniform distances. And the conveyor belt will be powered using a DC motor. So, every 6 hours the motor will be switched on to push the hay roll into the wooden box. For water we need a water source from where water will be pumped into the water box. A Solenoid valve will be used to let the water into the water box. Every 6 hours the solenoid valve will be switched on till the required amount of water is poured into the box. In this way we can avoid the spreading of viruses and a farmer can save his time and energy too.

E. Source codes

```
int relay1=D0;
int relay2=D2;
void setup()
{
  pinMode(relay1,OUTPUT);
  pinMode(relay2,OUTPUT);
}
void loop()
{
  relay1();
  relay2();
}
void relay1()
{
  digitalWrite(relay1,HIGH);
  delay(5000);
  digitalWrite(relay1,LOW);
  delay(5000);
}
void relay2()
{
  digitalWrite(relay2,HIGH);
  delay(5000);
  digitalWrite(relay2,LOW);
  delay(5000);
}
```

VII. RESULT AND CONCLUSION

A. Result

Our project demonstrated the mentioned working successfully. The code generated from ESP8266 Node MCU established connection with the Motor and Solenoid Valve, through which the Hay and Water are dispersed to the

cattle's for every 6 hours.

B. Future Enhancements

Our bot might be still at prototype level but it can be upgraded with many more features like adding a camera so that the user can ensure that the hay and water has been dispersed to the cattle's. Our idea can also be implemented in large scale places where a group of chambers can be setup in a single cow-barn, with the above mentioned technology so that the cattle man can easily check the hay or water of a particular cattle in their respective chamber.

C. Conclusion

Our Dispenser has a very much potential in the market. It helps many individuals in the time of any infectious disease who are having cattle as it helps the individual in not being in contact with the cattle and providing food and water without infecting the cattle or himself.

ACKNOWLEDGMENT

We would like to express our sincere thanks to Mr. Narayana (Executive), for his guidance and support in completing our project.

We would also like to express our gratitude towards our Technical Heads Mr. Ajay Kumar **and Ms. P.Tapaswini** for giving their guidance and supervision. Without their support and suggestions, this project would not have been completed.

REFERENCES

1. The reference or idea for the project is taken from the recent virus effected to cattle's named lumpy virus .
2. <https://youtu.be/o7VVmtX7SKs> for conveyor belt.
3. <https://randomnerdtutorials.com/esp8266-relay-module-ac-web-server/>.

VIII. RECORD OF EXPENSES

Components list			
Components	Quantity	Price	Total
DC motor	01	130	130
Solenoid Valve	01	280	280
DC shocked	01	15	15
12v adaptor	01	180	180
18650 2cell	01	35	35
70X40 wheel	06	48	288
18650 batteries	02	70	140
Node MCU	01	225	225
Cable	01	35	35
Relay	02	35	70
6X8 Pipe	01	40	40
jumper wire	60	01	60
Ball Bearings	03	80	240
		Total Cost	1740