Food Dispensary Customization as per User Requirement

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ABSTRACT

The Chicken poultry industry is a significant industry for manageable nourishment supply in our nation. The improvement of a programmed chicken feeding of machine can be extremely helpful to the development of the poultry business. In existing framework, the chickens need a nearness of labor to physically give the food to the chickens. The usage of suggested system can change the worker for feeding the chicken hence overwhelmed the labour issues in the industry and announce a semi-automatic process in the poultry industry. The System will be fit for moving starting with one point then onto the next inside a profound litter poultry house, just as administer both solid and liquid feed to poultry feathered creatures at explicit time interims. The effective improvement of the foreseen insightful poultry taking care of system is relied upon to lessen human mediation, increment return and benefit just as gives exceptional yield on investment in poultry cultivating.

Keywords*: Microcontroller, ATmega328, Arduino*

I. INTRODUCTION

Chicken ought to be appropriately brought up in request to accomplish such characteristics so that they are prepared be butchered. Feeding management is one of the factors that should be undertaken in order to raise healthy chicken. They should be given with the proper commercial feeds and a clean, adequate water supply. But nowadays, the development of technology was used to the conventional method of feeding chicken, which is by filling containers with grains, feeds, and water manually. The fundamental issue by doing this technique is the need to persistently give the nourishment, to be alert and to be conscious on the food staying in cages. The adequate measure of the food gave additionally can't be determined clearly. Producers additionally think that it's hard to deal with their organizations adequately on the grounds that they should be around the cages from time to time to monitor the poultry.

II. METHODOLOGY

Proposed Methodology

The study and execution of this device would be noteworthy and helpful in numerous perspectives. Firstly, the device is equipped with technology that was capable of providing a uniform time in feeding the chicken (or in other words, providing the chicken with the regulated amount of food and water based on the parameters being set). With this, regulated amount of food and water being fed by the system to the chicken saved and/ or reduced wasted feeds due to leftovers and/ or driven out by the mechanism. Also, because the device can dispense feeds at any set time without even monitoring at feeding time, the chicken raiser's time of monitoring the chicken would be lessened.

III. COMPONENTS USED

i. Arduino Mega

Arduino Mega 2560 is a Microcontroller board dependent on Atmega2560. It accompanies more memory space and I/O sticks when contrasted with different sheets accessible in the market. There are 54 digital I/O pins and 16 analog pins fused on the board that make this gadget one of a kind and stand apart from others. Out of 54 digital I/O, 15 are utilized for PWM (pulse width modulation). A crystal oscillator of 16MHz frequency is included the board. This board accompanies USB cable port that is utilized to interface and transfer code from

PC to the board. DC power jack is combined with the board that is utilized to power the board. This board accompanies two voltage controller for example 5V and 3.3V which gives the adaptability to control the voltage according to necessities when compared with Arduino Pro Mini which accompanies just a single voltage controller There is no much contrast between Arduino Uno and Arduino Mega aside from later accompanies more memory space, greater size and more I/O pins. Arduino software called Arduino IDE is utilized to program the board which is a typical programming utilized for all boards had a place with Arduino family. Accessibility of Atmega16 on the board makes it not quite the same as Arduino Pro Mini which utilizes USB to sequential converter to program the board. There is a reset button and 4 hardware serial port called USART which produces a maximum speed for setting up communication.

ii. LCD

LCD (Liquid Crystal Display) screen is an electronic display module and locate a wide scope of uses. A 20 x 4 LCD display is essential module and is usually utilized in different gadgets and circuits. These modules are preferred more than seven segments and other multi segment LEDs. A 16×2 LCD implies it can show 16 characters per line and there are 2 such lines. Right now character is shown in 5×7 pixel matrix.

A Command is a guidance given to LCD to do a predefined task like instating it, clearing its screen, setting the cursor position, controlling display and so on. The information is the ASCII approximation of the character to be shown on the LCD.

iii. Relay

Relays are most usually usage switching device in electronics. One is the Trigger Voltage, this is the voltage required to turn on the relay that is to change the contact from Common->NC to Common->NO. Our relay here has 5V trigger voltage, however you can likewise discover relays of qualities 3V, 6V and even 12V so select one dependent on the accessible voltage in your venture. Since the relay has 5V trigger voltage we have utilized a +5V DC supply to one finish of the curl and the opposite end to ground through a switch. This switch can be anything from a little transistor to a microcontroller or a chip which can perform switching working. The purpose of the Fly back diode is to protect the switch from high voltage spike that can produce by the relay coil.

iv. Transformer

A centre-tapped transformer also recognised as two phase three wire transformer is generally used for rectifier circuits. As soon as a digital project has to work with AC mains a Transformer is used to step-down the voltage (in our case, to 24V or 12V) and then converts it to DC by using a rectifier circuit In an center tapped transformer the peak inverse voltage is twice as in bridge rectifier henceforth this transformer is regularly utilized in full wave rectifier circuits. An essential voltage will be prompted in the primary loop (I1 and I3) and because of magnetic induction the voltage will be moved to the secondary coil. Here in the secondary coil of a centre tapped transformer, there will be an extra wire (T2) which will be set precisely at the center of the auxiliary curl, thus the voltage here will consistently be zero. On the off chance that we join this zero potential wire (T2) with either T1 or T2, we will get a voltage of 12V AC. On the off chance that this wire is ignored and voltage across T1 and T2 is viewed as then we will get a voltage of 24V AC. This component is helpful for the function of a full wave rectifier.

v. Darlington Transistor array

The ULN2803A is a high-voltage, high- current Darlington transistor exhibit. The device comprises of eight npn Darlington sets that include high-voltage yields with basic cathode clamp diodes for exchanging inductive loads. The Darlington sets might be associated in parallel for higher current capacity. Applications incorporate relay drivers, hammer drivers, light drivers, display drivers, line drivers, and logic buffers. The ULN2803A has a 2.7-kω series base resistor for each Darlington pair for activity straight forwardly with TTL or 5- V CMOS gadgets. Also, 9 and 10 pins are ground and regular cathode node (Vcc) separately. Note that basic emitter is shared by all the channels.

vi. Voltage Regulator 7805

7805 is a voltage controller incorporated circuit. It is an individual from 78xx arrangement of fixed linear voltage controller ICs. The xx in 78xx demonstrates the fixed ouput voltage it is intended to give 7805, gives

+5V controlled power supply and our case the 7805 IC is an iconic controller IC that discovers its application in the vast majority of the projects. The name 7805 signifies two signifying, "78" implies that it is a positive voltage controller and "05" implies that it gives 5V as output. So our 7805 will give a +5V output voltage. In any case, the IC experiences substantial heat loss subsequently a Heat sink is suggested for projects that devour progressively current.[7]

7812

7812 is a 12V Voltage Regulator that confines the voltage yield to 12V and draws 12V controlled power supply. The 7812 is the most well-known, as its managed 12-volt supply gives an advantageous power source to most TTL components.7812 is a progression of 78XX voltage controllers. For ICs inside the family, the xx is supplanted with two digits, showing the output voltage (for instance, the 7805 has a 5-volt yield, while the 7812 produces 12 volts). The IC 7812 is a positive voltage controller which implies that it produces the positive voltage regarding the shared belief. In case if both the positive and negative voltage supply is required in a similar circuit

vii. Load cell

A transducer that was utilized to make an electrical signal whose magnitude was directly relative to the power being estimated. Right now, load cell gauges the feeds to be dispensed.

IV. SOFTWARE USED

Arduino Software (IDE)

The Arduino Integrated Development Environment (IDE**)** is a computer application and is basically written in two languages i.e. C and C++.With the help of this software we can easily upload the required program code on the Arduino board. There are wide varieties of Arduinos but here we have used ATmega328. The board consists of digital and analog pins out of which 6 are analog and the remaining are digital. The power to the board is given through the USB cable. The software consists of the text editor where the program code is written and it consists of various inbuilt functions. The programs are then uploaded to the Arduino uno with the help of USB cable. The programs written in this software must be saved with ino extension. After the program is written it is first of all verified and then uploaded on the board. If there is any error in the code then it displays it on the screen and thus the user can correct the code. The output can be seen on the serial monitor provided by the software.

V. RESULT AND EXPLANATION

Figure shows the conceptual framework for the food dispensary customization showing the processes of feeding. To add, a power source is needed for the microcontroller unit (MCU i.e. Arduino mega) to perform the necessary tasks. In terms of feeding, the motors that were in the Dispensing Mechanism and Drive System were required for transporting and delivering of feeds from the silo all the way to the pan feeders. The dispensing mechanism consists of weighing of the food items through the load cell and dispensing it into the silo. In feeding the chicken, the load cell is merely proficient of weighing up to 80 grams of feeds. However, it can be upgraded into a better load cell that can carry a larger amount of feeds for a higher number of chickens in the cage. The same goes with the “silo” and the driving motor, wherein they can be scaled up to accommodate the increase in the population of chicken. Through the keypad we can define the maximum weight for the food items.

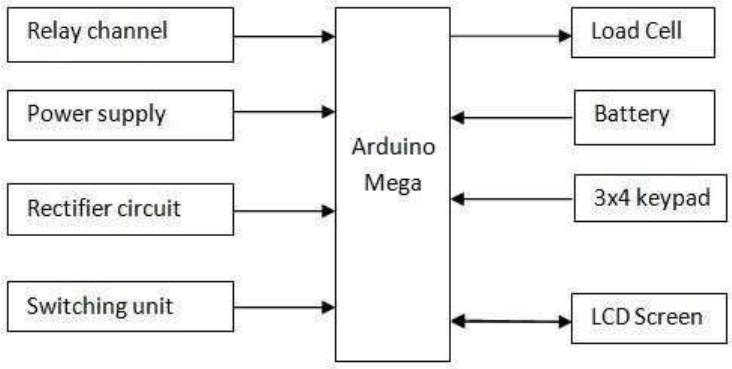

fig: System Architecture for the proposed system

VI. FUTURE WORK

- Alarm System when the device failed to dispense and/or to deliver feeds.
- Automatic chicken manure cleaning and water sanitization as well as placement of light sensor for automatic lighting.
- Evacuating the flip holder and making the silo move rather to accelerate the conveyance of feeds.
- Installation of a mini-circuit breaker and electrical conduits for safety purposes.
- Mounting of a fixed water reservoir and enlargement of the water trough.
- This system is completely an automatic system to screen and control the natural changes, for example, temperature, water level and food feeding taking care of with less human intercession.
- This paper can be stretched out via automating the removal of waste and consequently recognizing the sicknesses of birds by checking the weight of the bird.
- This system can also be used for the dispensing food items for other animal husbandry applications such as pisciculture, goat farming, etc.

VII. ADVANTAGES:

- This system helps in making a traditional farm into intelligent farm.
- Productive management is observed in poultry farm.
- It saves time, dependency of labours and also manage poultry production.
- The system allows the owner to monitor the several food weight parameters.
- Poultry farming automation can help in chicken feeding by which feeding can be guaranteed the uniform, which can improve the uniformity of poultry growth.

VIII. CONCLUSION

This is a low price system as it decreases the price of hiring labours. Since all the operations are automated it is an easy to use the system. It is likewise a flexible system as it can be combined into small and medium sized poultry farms with negligible changes. Currently this system also provides many options which are user friendly enabling the farmer to manage all the necessary farming factors resulting in increased number of population and food. This system has distance coverage of 30 miles.

REFERENCES

[1] Journal of Emerging Trends in Engineering and Applied Sciences (JETEAS). 4(6), 837-846p, © Scholarlink Research Institute Journals, 2013 (ISSN: 2141-7016) jeteas.scholarlinkresearch.org

[2] APEDA. 2006. Residue monitoring plan for 2006, for drugs and pesticides for exported egg products to the European Union. New Delhi, Agricultural and Processed Food Products Export Development Authority.

[3] Bharadwaj P.K. *Undated Poultry market – opportunities for the farmers*. Coimbature, India, Suauna Poultry Farm Ltd.

[4] Mohanty S., Rajendran K. *2010 vision for Indian poultry*. International Journal of Poultry Science. 2(2), 139– 143p, 2003.

[5] Mahale R.B., Sonavane S.S. *Smart Poultry Farm: An Integrated solution using WSN and GPRS based network*. International Journal of Advanced Research in Computer Engineering & Technology (IJARCET). 5(6), June 2016.

[6] Md. Abas A.M.F. *Chicken farm monitoring system farm*. International Conference on Computer & Communication Engineering. May 2016.

[7] Laknizi A., ElMaakoul A. *Evaluation of Earth-air heat exchanger for cooling and heating a poultry house: Case study in Morocco.* May 2016.

[8] Ammaduddin M. *Wireless sensor network: A Complete solution for poultry family*. IEEE 2nd International Symposium on Telecommunication Technologies (ISTT), Langkawi, Malaysia (24-26 Nov 2014).