# Smart Farm Monitoring Using Raspberry Pi and Arduino

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## ABSTRACT

This study aimed associate degreealyzean institution mistreatment associate Intelligent System that used an Embedded System and good Phone for chicken farming *Raspberry Pi and Arduino Uno. Associate experiment and comparative analysis of the intelligent system was applied during a sample farm during this study. The findings of this study found that the system may monitor encompassing climate as well as wetness, temperature, climate quality, and conjointly the filter fan switch management within the farm. The system was found to be comfy for farmers to use as they may effectively management the farm anyplace at any time, leading to value reduction, quality saving, and productive management in chicken farming.

**Keywords :** Embedded System, Raspberry Pi, Arduino, Android, Smart Phone.

## I. INTRODUCTION

Thailand was thought of as AN agricultural affluent country in terms of food and environmental resources. Not with standing, such prosperity was bit by bit regressed directly contributive to an occasion a agricultural productivity and farmer incomes. The farmers in addition lacked insights in agricultural promoting ways and prime quality production coming up with. [1]According to world's agricultural manufacture, chicken is that the most favored manufacture, since it's a nutrient-rich food providing high macromolecule, low fat and cholesterol in, and lower energy than other forms of Poultries. Also, it's quite simple to appear once and propagate its species. [2] For five years, the chicken production in Thailand has been increasing on a median of four.63% yearly due to standardized farming management and sensible producing practices, resulting in a lot of chicken consumption Associate in Nursing an inflated export variety of each domestic and international destinations. On the opposite hand, a lacking of labor in chicken production processes has affected recent chicken export that is found to be the principal downside. [3] Another vital Obstacle is wrong data sharing and folk's knowledge in chicken farming that effects potency. This study aims to line up a brand new model by employing a trendy technology applied to chicken farming called a "Smart Farm" or "Intelligent arable farm", that's manifesto clear up the rural Issues. Good Farm might understand any modified data derived from a semi-automatic silicon chip, alarming all notification to a connected laptop computer. The farm observance may be conducted via application programs on good phones for convenience use, time saving, and increasing labor reduces.

## II. LITERATURE SURVEY

This analysis has targeted on the employment of recent technology to assist manage animal farming, which implies farm management automation in numerous ways that Man cannot handle [4] studied the model of farm management computerization tools with RFID, Result; the approval of RFID, or radio-frequency identification of objects and animals as well as five sorts of animal: oxen, buffalo, sheep, pigs and rabbits were with success singly known and recorded mechanically.
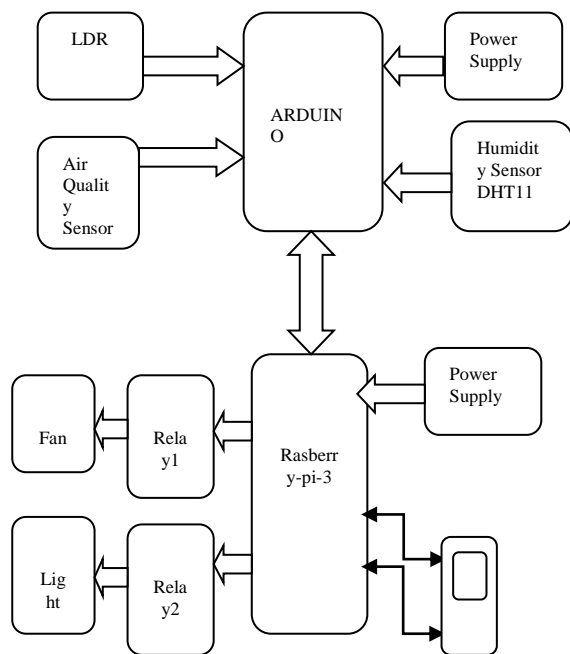
Md Saifudaullah Bin Bahrudin and Rosni Abu Kassim [5] conferred fireplace|a fireplace|a hearth} warning device in a very period observance system that detected the presence of smoke within the air attributable to fire and captured pictures via a camera put in within an area once a hearth happens. The embedded systems

accustomed develop this hearth warning device were Raspberry Pi and Arduino The key aspect of the system is that the ability to remotely send AN alert once a hearth is detected. once the presence of smoke is detected, the system can show a picture of the space state in a very website. The system can would like the user confirmation to report the event to the fire-eater employing a Short Message Service (SMS). The advantage of mistreatment this method is that it'll cale back the chance of false alert according to the fire eater. The camera can solely capture a picture, thus this method can consume solely slightly storage and power. Kumar associate degreed.Hancke [6] given an animal health observation System (AHMS) for observation the physiological parameters like rumination, vital sign, and rate with encompassing temperature and humidness. The developed system might additionally analyze the strain level such as thermal humidness index (THI). The

## III. SYSTEM BLOCK DIAGRAM



## IV. EXPLANATION OF SYSTEM COMPONENTS

Shown in figure one, parts of the automated farming system on Raspberry Pi Model B and Arduino Uno square measure incontestable. The system will inform employing a period menacing system to good phones news like the present and daily highest/lowest warmth

IEEE802.15.4 and IEEE1451.2 standards primarily based detector module was additionally developed with success. The zigbee device and PIC18F455 microcontroller were utilized in the implementation of detector module. The graphical program (GUI) is enforced in Lab VIEW nine.0 consistent with the IEEE1451.1 standard. the important time observation of physiological and behavioral parameters will be gift on the graphical user interface computer. The device is incredibly useful and a cheap health care of eutherian mammal. A image model was developed and tested with high accuracy results. From the higher than. There area unit several new technologies that may be employed in a additional economical management of farms. The authors study has targeted on the importance of contemporary technology of Raspberry Pi, Arduino and good Phone combined with chicken farming

moisture, and ride out quality of the farm environment. Users can even management the filter fan switches and customize the notification system to the good phone.

1. Raspberry Pi:

Raspberry Pi [7] could be a tiny laptop board engaged on the UNIX software package that connects to a laptop monitor, keyboard, and mouse. Raspberry Pi is applied to a electronic structure and programming network work, it can even served as a private laptop and Apache Web server, MySQL may be put in within the board. A GPIO [10] pin are often used as either a digital input or a digital output, and each operate at three.3V. in contrast to the Arduino, the Raspberry Pi that doesn't have any analog inputs. For that you simply should use AN external analog-digital converter (ADC) or connect the Pi to A crossing point panel should be used Arduino is ANASCII text file microcontroller compatible with developed platforms. The controller seems to not be costly and uses low electric power, 5.5 volts. C and C++ were utilized for this development. Arduino will hook up with a laptop via the Universal Serial Bus (USB) and perform with compatible connected accessories in each analog signal and digital signal. The Arduino [9] could be a microcontroller platform, mounted on a board that plugs simply into most computers. It permits the user to program the aboard Atmega chip to try to to numerous things with artificial language, in programs referred to as sketches.

## 2. Humidity Sensor module

Environmental conditions directly have an effect on animal living contributory to some chronic epidemics like Bird grippe and Hand Foot and Mouth sickness. Therefore, DHT22 is use as a censor for measure temperature (for each Fahrenheit and Anders Celsius value) and humidness. The measuring unit are incontestable in a very digital signal type

## 3. Gas Sensor module

The module works as a Air Quality Detection Gas detector, this is often sensitive to gas dangerous to human, applied to live NH3, NOx, Alchohol, Benzene, CO, and CO2. The module is additionally used for dominant atmospheric condition and air cleaners in buildings. The menstruation unit is conferred during a analog signal. in this analysis, 3 censor forms were used, consisting of MQ-2, MQ-135, and MQ-136 attributable to its gas menstruation variations Photosensitive sensor module (LDR)

A light-weight sensing element was used for measuring of sunshine intensity particularly for eye light, its unit is termed lx [8].Light Dependent resistance (LDR) may be a light-weight sensitive resistance dynamic electronic resistance once there's a lightweight incidence, known as ikon resistance or ikon Conductor. The resistance was made up of Semiconductor, sulphide (Cds) or metal Selenide (CdSe). These 2 substances square measure semiconductors coated in a very ceramic sheet as a base.

## Software

A association between Raspberry Pi and sensible phones was investigated during this study. Programming of a communication between a server and a consumer consisted of 2 views. The Raspberry Pi would check whether or not there was any connected purchasers, if so, a mutual information transmission would be done. By doing this, associate degree application would send the information via Socket bearing on informatics Address and Port in Transport Layer victimization transmission control protocol.

Linux was the most software system used for Raspberry informatics. During this analysis, Raspbian Wheezy, associate degree economical software system confirmed

by the producer, was put in on a Mount Rushmore State Card via Application Win32

Disk Manager. When the installation, informatics Address configuration, camera configuration, UART association, and Apache Webserver installation would be conducted.

## V. FLOW CHART
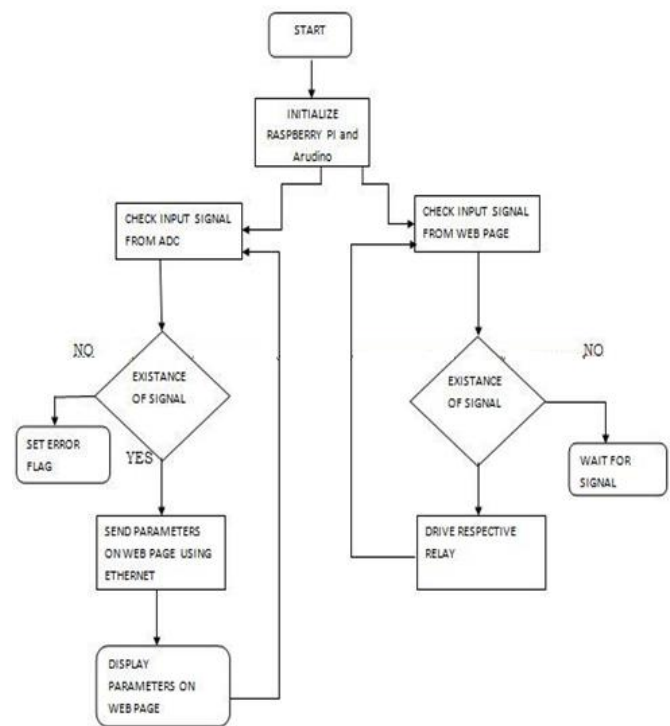


ALGORITHM USED FOR SMART FARM MONITORING USING RASPBERRY PI AND ARDUINO

1. Start
2. Initialize raspberry pi and Arudino.
3. Check input signal from ADC and web page
4. Go to step 9 if there is no signal from ADC
5. Send parameters from ADC to web page.
6. Display parameters on web page.
7. Go to step 9 if there is no signal from web page
8. Drive respective relay according to input from web page.
9. Wait for 5 second after that go to step 3

## VI. CONCLUSION

The embedded system is innovative for chicken farming that changes a standard farm to a "Smart Farm or Intelligent arable farm". In accrual, the mortal compel

effort on applications of sensible phones serving to the farmers to manage and monitor real time environmental contexts like temperature, weather condition and quality, humidity, lightweight and filter fan switches. The intelligent system will scale back price, time, and labor and is extremely u ser friendly for farmers.

## VII.    ACKNOWLEDGEMENT

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